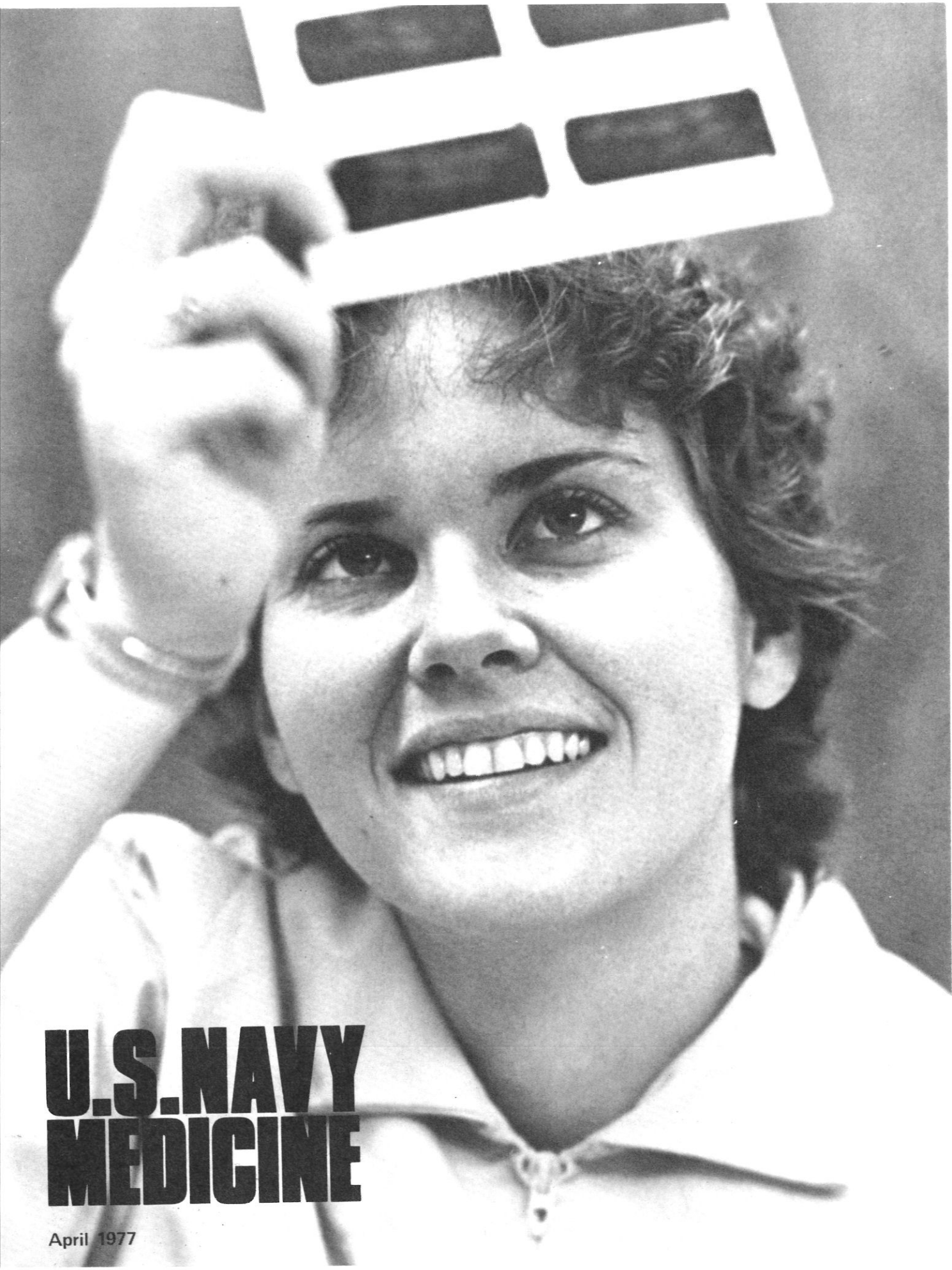


U.S. NAVY MEDICINE

April 1977

POLICY: *U.S. Navy Medicine* is an official publication of the Navy Medical Department, published by the Bureau of Medicine and Surgery. It disseminates to Navy Medical Department personnel official and professional information relative to medicine, dentistry, and the allied health sciences. Opinions expressed are those of the authors and do not necessarily represent the official position of the Department of the Navy, the Bureau of Medicine and Surgery, or any other governmental department or agency. Trade names are used for identification only and do not represent an endorsement by the Department of the Navy or the Bureau of Medicine and Surgery. Although *U.S. Navy Medicine* may cite or extract from directives, official authority for action should be obtained from the cited reference.

DISTRIBUTION: *U.S. Navy Medicine* is distributed to active-duty Medical Department personnel via the Standard Navy Distribution List. The following distribution is authorized: one copy for each Medical, Dental, Medical Service and Nurse Corps officer; one copy for every 10 enlisted Medical Department members. Requests to increase or decrease the number of allotted copies should be forwarded to *U.S. Navy Medicine* via the local command.

CORRESPONDENCE: All correspondence should be addressed to: Editor, *U.S. Navy Medicine*, Department of the Navy, Bureau of Medicine and Surgery (Code 0010), Washington, D.C. 20372. Telephone: (Area Code 202) 254-4253, 254-4316, 254-4214; Autovon 294-4253, 294-4316, 294-4214. Contributions from the field are welcome and will be published as space permits, subject to editing and possible abridgment.

The issuance of this publication is approved in accordance with Department of the Navy Publications and Printing Regulations (NAVEXOS P-35).

NAVMED P-5088

U.S. NAVY MEDICINE

Volume 68, Number 4
April 1977

COVER: LT Dorothy E. Knuppel (DC), of Naval Regional Dental Center Charleston, is one of many talented women finding opportunities for professional growth in the Navy Medical Department. *U.S. Navy Medicine* reports on the growing role of Medical Department women beginning on page 12.

Alcohol: Deglamorizing the Myth

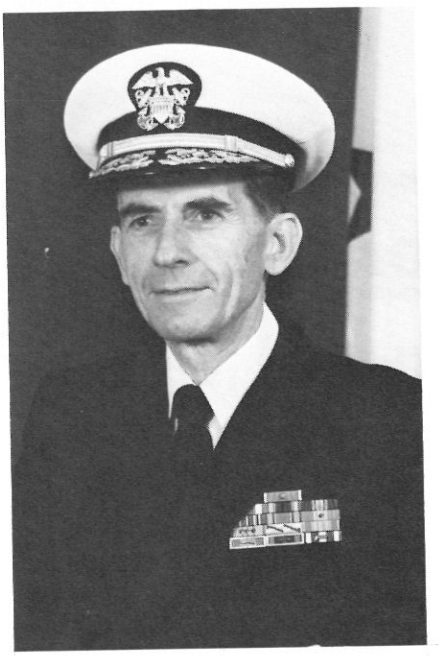
OVER THE PAST several years, the Navy has built an alcohol rehabilitation program that enjoys a fine reputation in the professional community. By attending special training courses, many Navy medical officers have developed mature attitudes toward alcoholics and improved their skill in bringing these men and women to sobriety, later applying this knowledge in daily clinical practice. Navy alcohol rehabilitation services, centers, and units are filled to capacity and the waiting lists remain long.

Now we must focus on prevention as well as rehabilitation. It is more humane, intelligent, and economical to stop people from becoming alcoholics, whenever we can, than to rehabilitate them. Rehabilitation efforts are inevitably associated with loss of time and expenditure of resources, and are often undertaken only when irreversible damage has already been done to the alcoholic's family, health, finances, and reputation. Even under the best conditions, there is a 20% to 30% risk of failure.

Our seafaring tradition includes rituals that encourage heavy drinking as a sign of vigor and good fellowship. This tenacious myth stems from the days of the galleons; it has no place in a modern Navy. We in the Medical Department must dispel this folklore not only by what we say, but more important, by our leadership and our example. I therefore urge that we deglamorize alcoholic beverages at Medical Department social functions, official and unofficial, from receptions to picnics. There is nothing happy about the traditional "happy hour" ashore where people are encouraged to drink in lieu of more productive or wholesome pastimes. Some shipmates suffer penalties, injury, sickness or death as a result of get-togethers where heavy drinking prevails with official sanction.

Drinking patterns vary from base to base, and caution must be exercised lest total prohibition lead to severe surreptitious drinking, as it tends to do in nominally abstinent homes and societies. Medical Department members should support strict enforcement of Control Instruction 1503 in the **Manual for Messes Ashore**, whose key words are ". . . abstinence shall at all times be encouraged, with moderation expected. . . ."

The Medical Department must take a leading role in curtailing irresponsible drinking in the Navy. Specifically, all Medical Department members must act responsibly in their consumption of alcohol, or avail themselves of rehabilitation.



VADM Arentzen

W.P. ARENTZEN
Vice Admiral, Medical Corps
United States Navy

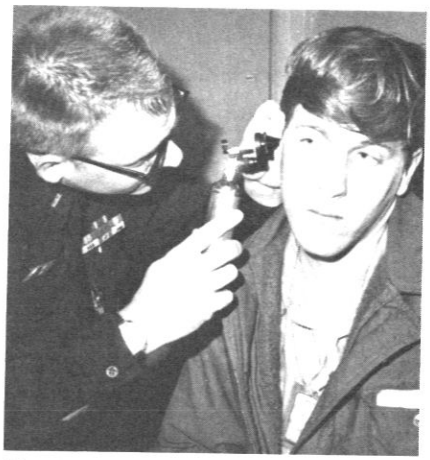
Fleet liaison personnel from NRMC Charleston board submarine to administer swine flu vaccine

Department Rounds

Fleet Liaison: Covering the Waterfront

When three Army men contracted hepatitis aboard a Navy troop carrier headed for Fort Lewis, Wash., the vessel's concerned senior medical officer wired Naval Regional Medical Center Bremerton, where a staff member alerted CDR Richard A. Nelson (MC) at his home at 2200. By sunrise CDR Nelson had arranged to board the ship as it entered Puget Sound. By 0730 that morning, Dr. Nelson, accompanied by another medical officer and a civilian preventive medicine specialist, was on board investigating the outbreak. After determining that mass immunization wasn't needed, the investigators made plans to evacuate the sick men to Madigan Army Medical Center at Fort Lewis.

CDR Nelson is accustomed to midnight messages from ships with emergency medical needs. It's all part of his job as fleet medical liaison coordinator for NRMC Bremerton, and his staff's readiness to provide medical services of every description, at any hour, lies behind the success of the medical center's two-year-old fleet liaison program.



Physician's Assistant CWO2 Rich examines patient aboard USS Kitty Hawk

"Our job is to help the fleet obtain the medical services they need," says CDR Nelson, who also directs the occupational and environmental health service at NRMC Bremerton.

"Before each ship arrives in our area, we send the ship's commander a packet of information on services available from the medical center," he notes. "Also, our fleet medical and dental liaison team visits each vessel coming into Puget Sound for overhaul, or for any prolonged visit. We meet with the CO, executive officer, and senior medical representative to describe the services we can provide and to discuss how we can help them with any special needs. We stress that we are available around the clock—and the ships take advantage of that."

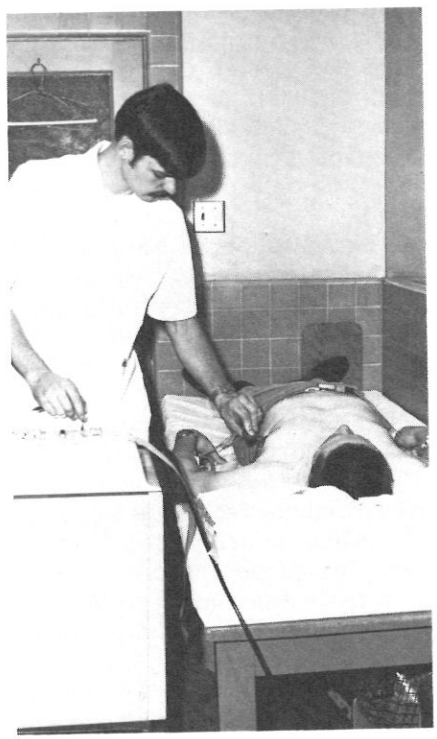
Waterfront clinic. To make medical services more accessible, NRMC Bremerton moved military sick call

Technician from NRMC Bremerton reviews X-ray on board USS Kitty Hawk

from the medical center emergency room to the industrial clinic at Puget Sound Naval Shipyard. Most fleet units now receive laboratory, X-ray, pharmacy, audiometric, and pulmonary function screening services at this waterfront clinic.

While a ship is in port, personnel from NRMC Bremerton are constantly going aboard to help out. "Our industrial hygienists make unscheduled visits to the ship during overhaul and are always available on short notice," says CDR Nelson. "Our environmental health personnel visit each ship when it arrives in the yard and schedule follow-up visits to conduct sanitation and habitability surveys, and to help with pest and communicable disease control."

"When a ship has been completely overhauled," he continues, "we often send a physician or industrial hygienist to accompany it on sea trials." NRMC Bremerton physicians regularly fill in for physicians who must be away from their ships, and a chief hospital corpsman



At Puget Sound Naval Shipyard clinic, HM2 Crist cares for crewmember

from the medical center recently replaced a corpsman who was on emergency leave when his ship went back to sea.

Medical officers and corpsmen assigned to fleet units get priority placement in Bremerton's training programs so they can keep up with the latest medical and surgical techniques. Crewmembers, too, get the red carpet treatment: any man referred by his ship's medical department must be seen within five working days of the referral, even if it means rescheduling appointments for dependents and retirees.

Fleet liaison officers at Bremerton also function as arbitrators. "We are able to prevent minor misunderstandings from becoming major problems," CDR Nelson points out, "by inviting representatives from fleet units to sit on the medical center's consumers' council."

Shore-based services. The Navy Medical Department started the fleet medical and dental liaison program two years ago to make it easier for ships to secure shore-based medical services. Nearly all regional medical centers, regional dental centers, and hospitals now have liaison programs.

Communication—telling fleet units how to get medical help from the shore facility—is the key ingredient in a good fleet liaison program. Briefing teams are a popular way to advertise services: a team from Naval Regional Medical Cen-

Orthopedic clinic is held aboard USS Sierra

ter Naples flies to Rota, Spain, to board aircraft carriers entering the Mediterranean. The team spends three hours on board explaining how to secure medical evacuation services, what specialists and services are available at the medical center, and how to get appointments.

Without special arrangements, getting appointments on short notice can be a problem. The Naples solution: when a ship is nearing port, the ship's medical department sends a message to the medical center requesting appointments. Patient affairs officers then set up the appointments and send the ship the appointment schedule and instructions for patients. At Naval Regional Dental Center Norfolk, Va., the staff arranges blocks of dental appointments and mass treatment programs for crewmembers who anticipate a long deployment.

First goal. Some Navy medical facilities are taking clinics and specialty services right on board—or as close as possible. Naval Regional Medical Center Charleston converted a surplus trailer into a hearing conservation van by installing five audiometric testing booths. The van is parked at pierside so crewmembers requiring audiometric testing or ear protectors don't have far to go for care. NRMC Charleston also conducts orthopedic clinics on board the USS *Sierra* for SURFLANT ships.

Such efforts are enabling Navy medicine to fulfill its first goal: to support the fleet. The payoff is considerable, if NRMC Bremerton's results are any example. CDR Nelson reports that fleet liaison activities at that facility have produced "better working relationships, an easier and sometimes more appropriate provision of services, and better support of the Navy's operating forces."

Corpsman vaccinates crewmember at Bremerton waterfront clinic

Medical Record Shape-Up

Sam Slade, private eye, was just about to take his raincoat to the cleaner when the phone rang. "Mr. Slade? This is LT Confused at Naval Hospital Lost Gulch. We need your help—a patient's health record is missing."

Slade dashed to the hospital's outpatient department. Sure enough, the record had vanished. In its place was a NAVMED 6150/7 chargeout card, with no notation to indicate who had snatched the record.

Just then, a corpsman dashed in clutching the missing jacket. "I found it in a branch clinic," he cried. But Slade's intuition told him something was wrong: Where was the name of the clinic in which the patient was last seen? And who had treated the patient? There was a signature—but it was illegible.

For the first time in his long career, Slade was stumped. "This beats that Maltese falcon case," he growled.

No outpatient department ever called a private detective to search for a missing medical record, but in one way, the above story is true: records *are* sometimes lost at Navy medical facilities, and crucial information is sometimes illegible, or not recorded at all.

The most serious consequence of an improperly maintained health record may occur when a former Navy member files a claim for compensation. Information in the health records of active-duty personnel forms the basis for most claims these personnel file with the Veterans Administration after their release from active duty, BUMED officials who work with health records point out. Information in a health record may also play an important role in determining a person's rights to such benefits as pensions,

U.S. Navy Medicine

promotions, and income tax exemptions.

BUMED Notice 6150 of 2 Nov 1976 called for a general shape-up of medical records, and outlined some of the problems most frequently found by inspectors and auditors. Here are some of those pitfalls, and BUMED's advice on how to avoid them:

• *A medical record is borrowed, but there is no notation on the charge-out card to show who took the record or where it was taken.*

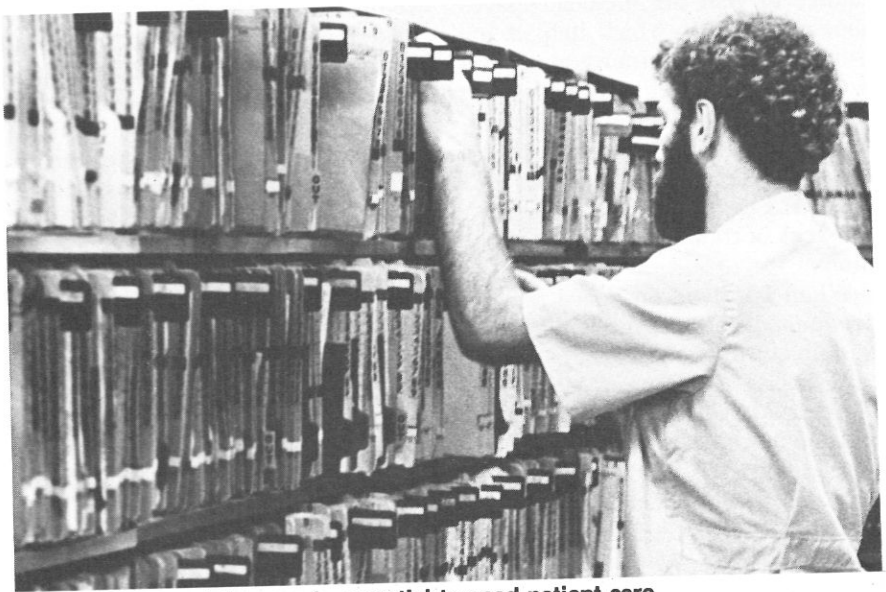
Whenever anyone checks out the health record of an active-duty member, he must note the date and where he is taking the record on a NAVMED 6150/7 chargeout card. Usually, the only way to locate a borrowed record is by referring to this card.

A standard chargeout card should be developed and attached to each outpatient record of dependent or retired patients. Anyone charging out these records can then fill in on the card the patient's name and family member prefix, the physician and clinic borrowing the record, and the sponsor's social security number. (Chargeout cards are optional for small activities where records can be controlled without using special forms.)

• *Information on medical care is not filed in the patient's record, or is filed loosely or out of order.*

Medical record pages should be kept in the standard sequence described in *Manual of the Medical Department* Article 16-2, and in BUMED Instructions 6322.11 and 6150.19A. If information is filed in the same sequence in all records, anyone needing specific information knows exactly where to look. Also, pages must be properly attached to prevent their falling out when the record is carried from one office to another.

• *Signatures are illegible, so there is no way to determine which medical officer, physician's assistant or corpsman saw the patient.*



Proper record maintenance is essential to good patient care

Anyone who makes an entry in a health care record should type, print, or stamp his or her name and rank under the signature. Blue or black ink should be used—other colors fade quickly and do not reproduce well.

• *Treatment information is not kept up to date, and there is no provision for systematic follow-up of patients.*

Each time a patient is treated, the physician should enter in the record the patient's complaint or condition, the treatment provided, and instructions given to the patient. Physical examinations and immunizations must also be recorded.

A system should be developed for following patients who need specialized examinations, X-rays, or immunizations, or who require follow-up tests or examinations because of their occupations.

• *Records are kept of patients who have been transferred or discharged from active duty, and of dependents who haven't been treated in three years.*

When a Navy member is released from active duty, his or her health and dental records go with the service record to the Naval Reserve Personnel Center in New Orleans. For the present, health and dental records of Marines separated from active duty continue to go to the Bureau of Medicine and Surgery. For details, see *Manual of the Medical Department* Articles 16-9 and 16-20.

If dependents or retirees have not been treated in a Navy medical facility for three years, their records should be sent to the National Personnel Records Center in St. Louis, Mo. See BUMED Instruction 6322.11 for details.

• *Records are accessible to unauthorized personnel.*

Medical records should be kept in a secured area to ensure the confidentiality of personal information.

• *Dependents' outpatient records do not include up-to-date information on their eligibility for Navy-sponsored health care.*

The health record of a non-active-duty beneficiary must include the expiration date of the patient's identification card as well as the sponsor's identification number, to ensure that only eligible beneficiaries receive care at government expense.

If you aren't sure how to maintain or dispose of a medical or dental record, don't call a detective—contact CDR E.E. Rovario (MSC), head of the BUMED Records Management Branch, at (Area code 703) 697-4422, Autovon 227-4422. CDR Rovario can answer questions about the records of active-duty patients, as well as dependent and retiree patients.

On Duty

A Flight Surgeon Returns to Sea

CAPT Walter L. McLean, MC, USN

Of what possible use can a balding pediatric allergist be aboard an aircraft carrier, I wondered, when I received orders in 1975 to report aboard the carrier USS *Independence* (CV-62) for three months. As a participant in the pilot test of the fleet medical pool concept, I had joined a group of physicians selected to rotate between Navy medical facilities (National Naval Medical Center, in my case) and shipboard duty. Since I had last practiced as a flight surgeon in 1963—during Operation Deep Freeze at McMurdo Station, Antarctica—I wondered what had possessed the Bureau of Medicine and Surgery to send me back to sea. Little did I suspect the unanticipated rewards of my experience as a "90-day wonder."

The most difficult preparation was announcing to my wife that I would be going away again when she assumed that my job as an academician—training residents and fellows in pediatrics and allergy—made sea duty unlikely. But her understanding and strength made our separation and reunion tranquil.

First, I reviewed my notes from the basic flight surgeon course. I also found the *U.S. Naval Flight Surgeon's Manual* invaluable for reviewing my future duties and responsibilities.

Preventive medicine. After passing my flight physical examination and spending a day in physiologic training at Naval Air Station, Patuxent River, Md., I headed for Norfolk, Va. There I attended a two-day seminar on shipboard preventive medicine problems, learning how to combat rats, roaches, noise and heat aboard ship. I also had a chance to visit the medical spaces aboard my ship, which helped me tremendously in planning my future work. As final preparation, I spent two mornings in an eye clinic observing the work of optometrists and reviewing refractive errors and phorias. I could easily have used a full week of training in an optometry clinic.

When I arrived on board the *Independence*, I discovered that as a captain I outranked the senior medical officer, CDR (now CAPT) J.D. Morgan (MC). But we worked out a division of labor which posed no problems: CDR Morgan ran the ship's medical department, while I functioned as a flight surgeon for the squadrons. All four medical officers aboard the *Independence* shared duty at sick call, stood onboard watches, and performed physical examinations. We all interviewed crewmembers being considered for administrative separation from the Navy, for the Drug Exemption Program, and for referral to alcohol rehabilitation programs. We all spent time counseling crewmembers who had psychosocial problems.

Besides these regular duties, CDR Morgan and I visited naval hospitals in Rota, Spain, and Naples, Italy, to relate our needs for specialty consultations for our crew, aeromedical evacuations, and other medical services. We also offered our own specialty services in dermatology and allergy. (During the cruise I practiced my specialty by completing allergy workups on a number of crewmembers, and practiced pediatrics in port when crewmembers' wives and children flew to Naples for a Christmas visit.)

Because of my knowledge of cold weather medicine, gained during Operation Deep Freeze, I acquired the extra responsibility of briefing the crew on cold weather hazards before we went above the Arctic Circle during NATO exercises. As it turned out, only one cold weather injury occurred during the cruise: a crewmember developed mild frostbite of the toes while skiing on Mount Etna in Sicily!

Having come from a teaching hospital, I was well prepared to lecture on medical problems. When I first reported on board, the ship's physicians were instructing corpsmen through daily lectures before morning sick call. I suggested that one physician always be present in the sick call triage area to observe and train the screeners. The corpsmen found they could perform better examinations when a teacher was present.

Our lectures to pilots on smoking, nutrition, arteriosclerosis, and hypoxia were well accepted. I was also asked to speak on medical problems related to drug abuse, and learned my subject by reading and talking with drugtakers themselves.

Confidence. Perhaps my most rewarding experience was getting to know the men who face "peril in the sky," and a braver, more dedicated group I have never known. I shared with them the dangers of a "cat shot" [catapult shot] and arrested landing, and gained their confidence both as a friend and as a health care professional.

One good way to get acquainted with these men was to attend flight briefings, and to share their meals in the wardroom and the evening movies in the ready rooms. Soon I began to receive invitations to fly with them. But I had a small problem: I had been issued only a flight

CAPT McLean is assistant chairman of the Department of Pediatrics and director of the Pediatric Allergy Fellowship Program, National Naval Medical Center, Bethesda, Md. 20014.

USS Independence (CV-62) underway in the Mediterranean

suit and boots; before I could fly I had to borrow a helmet, oxygen mask, and survival jacket. In other words, I had to find a pilot my size who wasn't flying that day!

To appreciate the work done aboard a carrier, I found it valuable to observe as many shipboard activities as I could. Standing with the flight crew between two screaming jets poised on the catapults ready to be launched is not the healthiest activity, as I learned firsthand. Watching a group fire the eight chambers in a boiler that holds 1200 psi of steam, and remembering that our ship had had a boiler explosion which delayed our deployment, made me appreciate the problems of working in engineering spaces. I visited the paraloft to see parachutes tested, stopped by the liquid oxygen plant and the jet engine repair shop, and began to get a good idea of the work that goes into supporting the air group. And after I spent time in the combat information center, the carrier air traffic control center, and primary flight control, I understood better the complexities of air control aboard a floating airport.

The young men arriving aboard ship experience a tough, disciplined routine that differs greatly from the independence they previously enjoyed. Some have tried drugs and go through a painful withdrawal when their supply vanishes during the cruise. Other crewmembers become anxious and depressed because they are separated from their family and friends. A few are totally unsuited for adult life, on land *or* at sea—they are immature, and overly dependent on others.

We found many PPD converters, but no one had chest X-rays positive for tuberculosis. Since we didn't have the laboratory equipment to confirm active tuberculosis, we evacuated to shore facilities any patient suspected of having the disease; after they were evaluated and returned to the ship, we planned to follow these patients for one year with X-rays and isoniazid treatment.

Seven appendectomies and numerous circumcisions, vasectomies and excisions of cysts were performed during my three months aboard. CDR Morgan, a dermatologist, removed moles, skin carcinomas and cysts. Warts fell to cryosurgery, done by a corpsman every Tuesday. With so much surgical talent around, I was fortunate to get to do even an incision and drainage procedure—but that was all right with me!

Paramedical support. I was deeply impressed with our corpsmen. Their concern for patients, devotion to duty, and excellent morale made medical care during the cruise a successful team effort.

Our laboratory and X-ray personnel surprised me with the scope of the work they performed. I suggested that key lab and X-ray men train others to do their jobs, to give us backup when the key men were absent. Such training was begun and worked to our advantage when our X-ray technician developed appendicitis and had to go ashore at Naples.

Our corpsmen routinely performed electrocardiographic examinations and quality control was ensured by having two physicians read each electrocardiograph. Our excellent audiometry equipment enabled corpsmen to perform automatic audiometric tests in a soundproof room. Several flight deck and engineering department men were found to have sensorineural hearing loss and were removed from their noisy working spaces. Shipboard wards and physiotherapy areas were well equipped and manned by interested, capable corpsmen.

The corpsmen gave mass immunizations in the mess deck areas after it was discovered that one of the messmen had hepatitis. We called a special all-hands turnout to give gamma globulin shots to the entire crew. (Naval Environmental and Preventive Medicine Unit No. 7 in Naples supplied us with the large quantity of gamma globulin we needed.)

Looking back. I benefitted from my cruise in many ways I had not anticipated. How many people know the difference between the aurora borealis and the aurora australis from personal experience? I do—I saw both on my cruise. As a pediatrician interested in adolescent medicine, I learned firsthand about the drug culture when I detoxified a man who had taken an overdose of methaqualone. I witnessed the difficulties of the "air boss" as he supervised the landing of planes at night on a deck pitching and rolling on the high seas, and shared his satisfaction when the last plane was safely aboard.

Knowledge of the real Navy world gave me a special pride in the Navy. I developed a greater sensitivity to the need to support our men at sea in every possible way. Our crewmembers aboard the *Independence* performed their difficult tasks well in an environment fraught with danger even for the wary—one pilot and his A-7 Corsair II never returned from a flight.

Aboard the "*Indy*," I was able to contribute to the welfare of a wonderful group of men. I recommend sea life and the fleet medical pool experience to other medical officers.

Scholars' Scuttlebutt

Navy Clinics: A Rewarding Assignment for Specialists

CAPT Robert V. Rack, MC, USN
CDR Leslie C. Ellwood, MC, USN

He's board certified in pediatrics and he spends most of his time working in the outpatient clinic?

It is understandable that medical students and residents might wonder about this, in view of their traditional assignment to hospital wards and clinics. As board-certified pediatricians who enjoy practicing our specialty in a Navy outpatient clinic, we would like to discuss our work and perhaps give you a more positive outlook on a duty assignment you may one day receive.

The satisfactions of practicing primary care medicine in an outpatient clinic are both professional and personal. In primary care, physicians have many chances to practice preventive medicine, and to recognize and treat incipient disease. Using a medical history, careful examination, basic laboratory information and close follow-up, the primary care physician can alleviate much physical suffering and help patients avoid hospitalization by successfully treating them on an outpatient basis. Remember: although providing complex medical care in a hospital may be very satisfying to the physician, hospitalization is not necessarily the patient's preference. The regional clinic, complete with family physicians, does not have the sometimes intimidating "hospital atmosphere" of a regional medical center; instead, a familiar, friendly atmosphere makes the clinic an excellent setting for the medical, psychological and family counseling so important in medical practice.

Maximum interest. Since, as primary care specialists, we are the first physicians contacted when a medical problem arises, we are free to involve ourselves to our maximum interest and capacity in our patients' treatment. And we can practice the full range of our specialty by making time in our schedules for new patients, follow-ups, and complex cases.

There is plenty of opportunity to learn and teach during a clinic assignment. You can devise an effective postgraduate education program for yourself from lectures given by regional medical center specialists, from talking with civilian specialists to whom you refer patients, from films, from reports on meetings, and from staff members in your own clinic. Instructing nurses and corpsmen will help you maintain your teaching skills and will also improve the quality of care provided at the clinic. In our clinic, we instruct medical students; at other primary care clinics, physicians may supervise the clinical training of residents.

Satisfaction. Clinic physicians have the satisfaction of knowing that their assignment meets the Navy's critical needs. These physicians are located near their patients but can be drawn into the regional center as needed. Assigned to clinics, board-certified specialists can train nurses, corpsmen and ancillary personnel in primary care, and can advise general medical officers and clinical assistants on how to manage illness related to the specialty area. The nature of clinic practice also gives physicians time to get involved in other medical and community service activities, to the Navy's credit.

Disadvantages and irritants are inherent in any outpatient practice, although we believe they are outweighed by the satisfactions. One example: while we are unable to admit our own patients to the regional medical center and treat them there, we compensate by keeping in touch with the medical center physicians who *do* provide the care, and by following our patients after their release from the hospital. Although the clinic physician's skill in treating inpatients may suffer somewhat, any rustiness can be minimized by rotational assignment to the hospital for ward experience.

In a clinic, with its customary large patient load, it may be impossible to limit the number of patients each physician sees in a day. An appointment system for acutely ill patients is essential to solve this problem, as is occasionally referring patients who are not very ill to the medical center.

New emphasis. Unfortunately, the idea that clinic practice is second-class medicine is perpetuated by physicians who have never served in a clinic; subspecialists who assume that their days of providing primary care are over also add to the misconceptions. Yet a new emphasis in medical schools on ambulatory care is reaffirming the importance of the kind of medicine practiced in military clinics.

Clinic practice should be considered an opportunity to develop skills in outpatient care and to become more resourceful. All the satisfactions of a medical career—the practice of good medicine, personal involvement with patients, continuing education, teaching—are available to the primary care specialist who serves in a Navy clinic.

CAPT Rack is head of the Pediatrics Department, Admiral Joel T. Boone Clinics, Little Creek Amphibious Base, Norfolk, Va. 23520. CDR Ellwood is a pediatrician on the staff of the clinic.

Notes & Announcements

AMSUS ANNOUNCES 1977 AWARDS PROGRAM

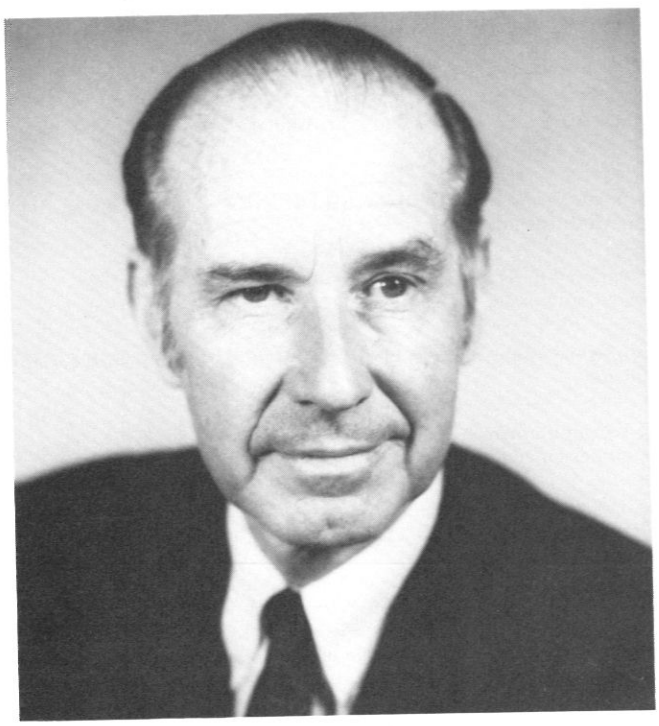
The Association of Military Surgeons of the United States (AMSUS) is accepting nominations for its 1977 awards, which honor federal health care workers for outstanding contributions (see chart, page 10).

Nominations of Medical Department officers should be submitted to the Director, Medical Corps Division, Bureau of Medicine and Surgery, 2300 E St. N.W., Washington, D.C. 20372, no later than 15 May 1977. Nominations should include a summary of the officer's qualifications and contributions, and a proposed citation. An original and four copies of each nomination should be submitted.

W. GRAHAM CLAYTOR, JR., IS NEW SECNAV

W. Graham Claytor, Jr., a railroad executive and lawyer who served as commanding officer of three Navy ships during World War II, has succeeded J. William Middendorf II as Secretary of the Navy.

A graduate of the University of Virginia and Harvard University Law School, Mr. Claytor took a leave of absence from his Washington, D.C. law firm to serve on active-duty in the Navy from 1941 to 1946. He commanded the USS *SC-516*, USS *Lee Fox* and USS *Cecil J. Doyle* and achieved lieutenant commander rank before his release from active duty. Mr. Claytor joined the Southern Railway System as a vice president in 1963, and became chairman of the board in 1976.



W. Graham Claytor, Jr.

FY77 SAILOR OF THE YEAR COMPETITION OPENS

Nominations are now being considered for the FY77 Atlantic Fleet, Pacific Fleet, and Shore Sailors of the Year. Enlisted members in grades E-4, E-5 and E-6 are eligible for the awards. Nominees must have been selected sailor of the month or quarter during the 24-month period ending 31 Dec 1976; units not having a sailor of the month or quarter program may nominate one person.

The Sailors of the Year will receive a meritorious promotion to the next pay grade if they meet minimum time in rate and length of service requirements; a trip with dependents to Washington, D.C., to receive the award; and a paid five-day holiday anywhere in the continental U.S. The Atlantic and Pacific Fleet winners may choose a year's duty as assistant to the master chief petty officer of the fleet; the Shore Sailor of the Year may serve a year's duty as assistant to the master chief petty officer of the Naval Education and Training Command.

Nominations of Medical Department members for Shore Sailor of the Year should be submitted to the Bureau of Medicine and Surgery (Code 34) by 18 April, in the format described in BUPERS Notice 1700 of 6 Jan 1977.

AFIP TO OFFER RADIOLOGY SEMINARS

The Armed Forces Institute of Pathology (AFIP), Washington, D.C., has announced a series of diagnostic radiology seminars designed to give radiologists an overview of the morphological principles used in evaluating roentgenographic signs. The sessions are:

2-6 May 1977	Special course on bone and chest.
11-15 July 1977	Special course on bone and chest.
19-23 Sept 1977	General course on bone, chest, gastrointestinal system, and genitourinary system.

The seminars are approved by the American Medical Association for 35 hours of Category I continuing education credit. Applications are available from the Director, Armed Forces Institute of Pathology, ATTN: AFIP-EDZ, Washington, D.C. 20306.

JUMPS COVERS ALL ACTIVE-DUTY PERSONNEL

The Joint Uniform Military Pay System (JUMPS) now covers all active-duty military personnel. JUMPS provides each Navy member with a monthly leave and earnings statement that shows the latest leave balance, pay entitlements, and deductions, and forecasts of those figures for the next two paydays. Conversion to JUMPS began in January 1976 and was completed in January 1977.

AMSUS Awards Summary

The table shown below and the following pages outline the awards program for 1977

AWARD TITLE	INITIATED BY	ACHIEVEMENT RECOGNIZED	PRIZE
The John Shaw Billings Award	Eaton Laboratories Div., Norwich Pharmacal Co.	AMSUS member under 41 for outstanding potential in Executive Medicine.	Plaque; $500.
**The Joel T. Boone Award	Ciba Pharmaceutical Co., Div. Ciba-Geigy Corp.	Outstanding service to the Association.	Silver plaque; $500.
The Ray E. Brown Award	Beecham Laboratories	Outstanding accomplishments in Federal health care management.	Bronze plaque; $1,000
The Andrew Craigie Award	Lederle Laboratories Div. American Cyanamid Co.	Outstanding accomplishment in advancement of professional pharmacy within the Federal government.	Silver plaque; $500.
The Federal Medical Residents Award	Purdue Frederick Company	Federal Medical Resident nominated by one of the Federal medical chiefs for outstanding performance as a resident.	Plaque; $500.
The Federal Nursing Service Award	Roche Laboratories Div. Hoffmann-LaRoche, Inc.	Best essay submitted in competition, advancing professional nursing.	Plaque; $500.
**The Founder's Medal	Executive Council, AMSUS	Outstanding contribution to military medicine and meritorious service to the Association.	Bronze medal; Scroll; Life membership.
The Donald H. Gaylor Award	DOW Lepetit USA	Outstanding contributions by a federal physician in the field of tuberculosis	Plaque; $1,000.
The Gorgas Medal	Wyeth Laboratories of Philadelphia	Distinguished work in preventive medicine.	Silver medal; Scroll; $500.
The Philip Hench Award	Merck, Sharp & Dohme	Outstanding contributions in field of rheumatology and arthritis.	Bronze plaque; $1,000.
The James A. McCallam Award	Norden Laboratories of Smith Kline & French Laboratories	Outstanding accomplishment in the field of medicine and health by a Doctor of Veterinary Medicine eligible for AMSUS membership	Plaque, $500.
**The William C. Porter Lecture	Geigy Pharmaceuticals Div. Ciba-Geigy Corp.	William C. Porter Lecture, on psychiatry, at Annual Convention.	Scroll; $750.
The MAJ Louis Livingston Seaman Prize	AMSUS Trust Fund left by MAJ Seaman	Notable article published in MILITARY MEDICINE during the previous calendar year.	Scroll; $250.
**The Sustaining Membership Lecture Award	Sustaining Members, AMSUS	Sustaining Membership lecture by AMSUS member, on medical research, at Annual Convention.	Scroll; $500.
The Sir Henry Wellcome Medal & Prize	Estate of Sir Henry Wellcome	Winning competitive essay on any subject relating to military medicine.	Silver medal; Scroll; $500.
*The Paul Dudley White Award	USV Pharmaceutical Corp.	Outstanding accomplishment in the field of Cardiovascular disease by person eligible for AMSUS membership.	Scroll; $1,000.
The MAJ Gary Wratten Award	Garret Corporation	Outstanding accomplishment in field military medicine by person eligible for AMSUS membership.	Bronze plaque; $500.

Nominations for 1977 awards recipients are currently being considered by Commanders and Directors of Federal Medical Facilities. Nominations must be received by the Awards Committee, postmarked not later than 31 May 1977, except the Seaman Prize, which is awarded from previously published articles in MILITARY MEDICINE; the Founder's Medal, which is selected by the President, as ratified by the Executive Council; the Porter Lecturer, selected by the Awards Committee; and Sustaining Membership Lecturer, selected by the chairman of Scientific Program and SM Section; and the Boone Award, which is selected by the Executive Director, as ratified by the Executive Council.

*New award for 1977.

**non-competitive.

Reprinted from Military Medicine, Vol. 141, No. 1, January 1977.

NRMC PORTSMOUTH SETS NURSING COURSES

The following courses for Navy nurses and paramedical nursing personnel will be given at Naval Regional Medical Center Portsmouth, Va. in 1977 and 1978. For further information contact LCDR Shirlee C. Hicks, NC, USN, Educational Coordinator, NRMC Portsmouth, Va. 23708.

1977	
1-19 August	Coronary care workshop for nurses (90 contact hours)
19-30 September	Critical care workshop for nurses (60 hours)
21 October	Fourth annual nursing symposium: "Evaluation Process" (6 hours)
31 October-18 November	Coronary care workshop for paramedical nursing service personnel (90 hours)
28 November-2 December	Critical care workshop for paramedical nursing service personnel (60 hours)
1978	
24 April-12 May	Coronary care workshop for paramedical nursing service personnel (90 hours)
29 May-2 June	Critical care workshop for paramedical nursing service personnel (60 hours)

ROENTGEN RAY SOCIETY OFFERS AWARD

The American Roentgen Ray Society offers an annual award for the best paper submitted on a clinical application of radiology. Manuscripts should not have more than 5,000 words or ten illustrations. The winner will receive a certificate and an honorarium of $1,000; the winning paper will be presented at the Society's annual meeting and submitted for publication to the *American Journal of Roentgenology*.

To apply for the award, send three copies of your paper and illustrations to A. Everette James, Jr., M.D., Chairman, Research and Education Committee, American Roentgen Ray Society, Department of Radiology and Radiological Sciences, Vanderbilt University Hospital, Nashville, Tenn. 37232. The application deadline is 1 May, and the winner will be announced by 15 July.

EIGHT FROM NRMC GREAT LAKES EARN MASTER'S DEGREES

Eight staff members of Naval Regional Medical Center Great Lakes, Ill., have received M.A. degrees in health facilities management from Webster College, St. Louis, Mo. The graduates earned their degrees by attending a special Webster College program held in the Great Lakes area. The program, which is accredited by the American College of Hospital Administrators, is also offered at Scott Air Force Base in Belleville, Ill., and Fitzsimons Army Medical Center in Denver.

The graduates are Medical Service Corps officers CDR N.C. Lachapelle, LCDRs J.E. Shepherd and H. Yates, Jr., and LTs R.A. Fink, C.H. Pointer IV, and R.E. Streumpler; Nurse Corps officer LCDR D.L. McKinney; and M. Shantinath.

HEARING CONSERVATION TRAINING SCHEDULED

A hearing conservation technician course will be offered 25-29 July 1977 at the Naval Aerospace Medical Institute, Pensacola. Naval regional medical centers that require such training for their personnel should notify BUMED Code 55 and send a copy of their request to the Commanding Officer, Naval Aerospace Medical Institute (Code 05), Pensacola, Fla. 32308.

DENTAL OFFICERS TRAINED IN CASUALTY TREATMENT

Twenty Navy dental officers completed a casualty treatment training course held 24-28 Jan 1977 at Naval Regional Dental Center Norfolk, Va. In the course, dental officers learn emergency casualty treatment so they can augment medical efforts during combat. Similar courses are held at Great Lakes, Ill., and San Diego, Calif.

Course graduates included the following Navy dental officers: CAPT R.J. Koss; CDRs C.E. Branyan, M.T. Ridley, and R.H. Harper; and LCDR G.A. Kurtz. Naval Reserve dental officers who completed training were LCDRs R.J. Glenn and W. Dvorak and LTs S.D. Cooke, J.K. Dowling, S.H. Nightingale, D.J. Singsank, A.F. Creal, Jr., E.D. Brinkley, Jr., A.T. Benson, K.M. Harrison, W.J. Kibbey, L.W. Jackson, T.L. Sutton, and M.J. Minarchek. LCDR L.J. Marconyak, DC, USNR-R also completed this training.

SMALL PASSPORTS INTRODUCED

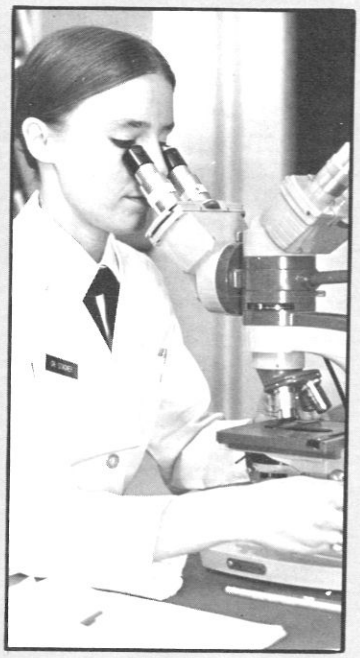
Like candy bars, calculators, and the size of the American family, the passport is shrinking.

On 1 Jan 1977, the U.S. Passport Office began issuing passports measuring 3½ inches by 5 inches. The new passports conform to international standards, thus simplifying passport inspection at points of entry into foreign countries. The reduction in size is expected to save the U.S. Government nearly $200,000 a year in printing costs.

The new passports are issued in three categories: regular (with a blue cover), official (maroon cover), and diplomatic (black cover). All three types are valid for five years from date of issue, unless otherwise indicated.

The regular passport issuance fee of $10 is not charged to military or civilian personnel and their dependents who are traveling under official government orders. Authorization forms (DD Form 1056) for obtaining these free passports are available from passport assistance offices on military bases.

Today Navy women serve in nearly every health care field: (clockwise from top left) Navy nurses care for newborn in intensive care unit; LTJG Doris Forte (MSC), Navy's first black woman optometrist, on the job at NRMC San Diego; dental technician teaches oral hygiene during National Children's Dental Health Week; LT Carolyn Stagner (MC) trains in the NNMC lab as part of her pathology residency; Navy occupational therapist works with a patient.



Medical Department Women

For Talented Trailblazers: Opportunity and Respect

A startled patient once looked up from the dental chair as LT Dorothy E. Knuppel (DC) reached for the drill, and asked, "Have you done this before?" But that was an exception: most of her patients take a woman dental officer in stride. A 1975 graduate of the University of Pennsylvania Dental School, LT Knuppel practices at Naval Regional Dental Center Charleston, and plans to specialize in prosthodontics. "I felt that the Navy had the most to offer in the field of dentistry, and I liked the choices of duty," she says.

LT Knuppel is one of scores of talented women who are making a name for themselves in the Navy Medical Department. Today Navy women serve in every health care field not associated with combat vessels.

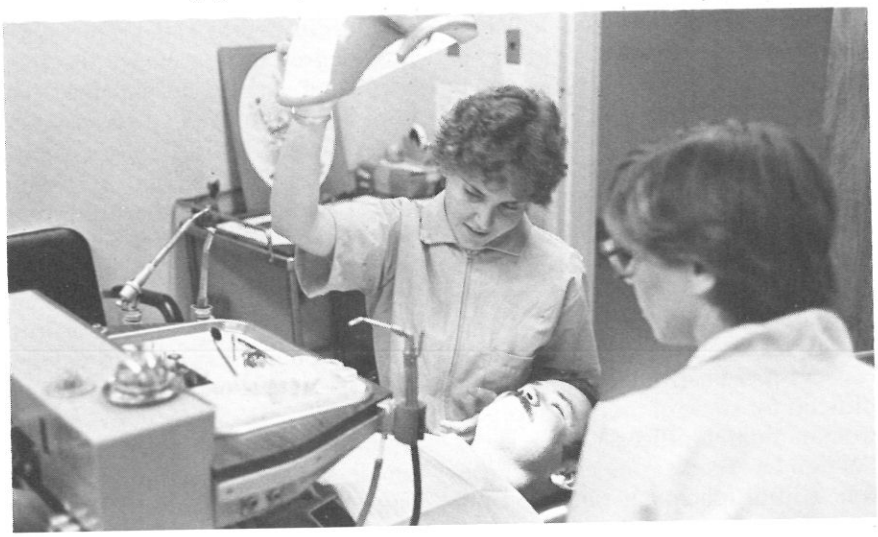
In the Medical Corps, the number of women has increased from 1 in 1948 to today's 105 active-duty women medical officers, including four captains. Typical of these dedicated women is psychiatry resident LCDR Becky Brinegar (MC), the only woman on the psychiatric staff of National Naval Medical Center.

"In general, my being a woman hasn't gotten in the way when I deal with patients or colleagues," LCDR Brinegar says. Colleagues, she admits, were curious about her before she arrived: "They'd never come across a female 'shrink' in the service, and they were dying to find out what I'd be like." And one or two patients didn't realize she was a physician: "There are always those times when you walk on the ward in your white uniform," she says, "and somebody calls 'Hey, nurse!'"

Career plans. The one time being a woman seriously impeded Dr. Brinegar's goals was when she asked to be assigned to the only psychiatry billet at Naval Regional Medical Center Okinawa. She was accepted on the basis of her qualifications, but the assignment was later vetoed because, as a woman, she could not deploy with Marine units if a psychiatrist were needed. She has since asked for an assignment to the alcohol rehabilitation unit at Naval Regional Medical Center Camp Lejeune, and plans to make her career in the Navy. "I like the Navy," she says. "It offers me the training I want in psychiatry."

Also happy with her Navy experience is CDR Alice M. Martinson (MC), chief of the Orthopedics Service at Naval Regional Medical Center Long Beach. The only female orthopedist in the Navy, she is one of two women at the helm of a specialty service in a Navy medical facility. (The other is CAPT Betty Meriwether (MC), chief of the Obstetrics and Gynecology Service at Naval Regional Medical Center Philadelphia.) "I'm very satisfied," says Dr. Martinson. "In medical school and in the Navy, I have never been treated with anything less than respect." Patients, she says, accept her but may be caught off guard at first. "I think if they're not expecting a woman, I catch them a little off balance. Then, by the time they recover from their surprise enough to comment, it's too late—they're out of the office!"

A Navy-sponsored graduate of George Washington University Medical School in Washington, D.C., Dr. Martinson served her internship and residency in orthopedics at Naval Regional Medical Center San Diego. She went to NRMC Long Beach in 1974 and two years later became chief of her service, which includes three other orthopedists. Pleased with her job, she hopes to move into executive



LT D.E. Knuppel (DC)
"Navy has the most to offer"

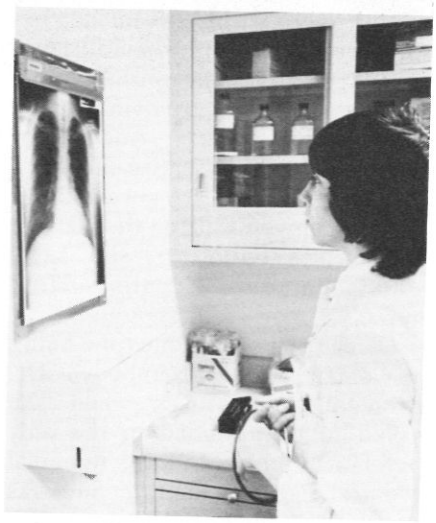
medicine, which she calls "very interesting and challenging."

Dr. Martinson recommends the Navy to women contemplating a medical career because "Navy residency programs are outstanding. You're working with the patient from day one, instead of first meeting your patient the day before surgery."

Critical specialties. Public Law 38, enacted in April 1943, first opened the Medical Corps to women —and then only temporarily—by allowing women to serve in certain critical specialties for the duration of World War II. Enacted as emergency wartime legislation, the law was repealed in 1947. But one year later the Women's Armed Services Integration Act decreed that "all laws . . . which authorized . . . appointments of commissioned and warrant officers in the Regular Navy shall . . . be construed to include authority to enlist and appoint women in the Regular Navy." Frances L. Willoughby, M.D., of Pitman, N.J., was appointed a lieutenant commander—the highest rank open to women—in the Medical Corps in October 1948, becoming the first woman to serve as a physician in the regular Navy. Legislation was later enacted allowing women to attain captain's and flag rank.

The law that today bars women from serving in combat-related jobs has not stopped women physicians from filling operational medical billets. In 1974, LCDRs Jane O. McWilliams and Victoria Voge became the Navy's first women flight surgeons after graduating from the Naval Aerospace Medical Institute in the top half of their class. Today Dr. Voge is the first and only woman entered in a Navy-sponsored aviation medicine residency, while Dr. McWilliams is the flight surgeon for Training Wing 6 in Pensacola, Fla. They're no longer alone: the Medical Corps now boasts five other women flight surgeons.

The first woman dentist to serve in the Armed Forces was LT Sara G. Krout (DC) of the Naval Reserve, who was on active duty at Great Lakes from 1944 to 1946. She retained her commission in the Reserve until she retired as a commander in December 1961. The Navy's second woman dentist, LTJG Elizabeth A. Tweed, was commissioned in 1944 and served almost two years at Naval Hospital San Diego. After these two officers left active duty, the Dental Corps was all-male until 1969, when Dr. Helen Paulus came on active duty. The Navy now has six female dental officers and sponsors 19 women dental students who will join the staffs of Navy dental facilities when they complete training.



LCDR J. McWilliams (MC)
One of five women flight surgeons

Reaction mixed. LT Birute A. Balciunas (DC), who was a Navy-sponsored scholarship student in dental school, says "the Navy scholarship program for dental students is excellent." Although she is the only woman officer ever to serve at her current duty station, the Marine Corps barracks in downtown Washington, D.C., she says, "I have no problem with patients. Marines are gentlemen, let me tell you."

But the reaction from male dental officers has been mixed. "It's just difficult for some of them to accept a woman dental officer," she says. "When I worked at one clinic, there was a little too much fatherly concern. They'd stop by 25 times a day to see how I was doing." Dr. Balciunas thinks women will be more easily accepted in the Dental Corps when there are more female dental officers.

While women dentists have been relatively rare in the Navy, women have served as dental technicians since the rating was established in 1948. By 1969 the Navy had its first female master chief dental technician, DTCM Johnnie L. Davis. Today, 621 or 15% of the Navy's 3,742 dental technicians are female, including four chief dental technicians.

Women are no longer scarce in the Medical Service Corps, either. Today's Medical Service Corps includes ten women health care administrators, four female pharmacists, and four women optometrists. Another 23 women are biologists, psychologists, medical technologists and specialists in other medical allied sciences, while 59 women serve as dietitians and occupational and physical therapists. Altogether, 100 of the 1,763 Medical Service Corps officers now on active duty are women.

The story of CAPT Kay Keating (MSC), the Navy's first woman pharmacy officer, shows how one woman forged a career in the Medical Service Corps and encouraged the acceptance of women officers as equal partners in Navy medicine. When World War II ended, CAPT Keating, then a radioman second class, returned to college to earn a B.S. degree in pharmacy. She then reenlisted, hoping to join the Hospital Corps, but was again assigned to radio work. In 1953, when a critical shortage of hospital corpsmen arose, she changed her rating to hospital corpsman first class and two months later advanced to ensign—the first woman to be commissioned a naval pharmacy officer.

In December 1953, as an ensign, she reported aboard the Navy hospital ship USS *Haven*, which promptly deployed to Korea. While female Nurse Corps officers had long been assigned to hospital

ships, CAPT Keating's tour in the *Haven* was a first for Medical Service Corps women, and a highlight of a successful career that ended with her retirement in 1972.

Competent. More than two decades later, MSC women are still trailblazers. Take LTJG Doris Forte, the Navy's first black woman optometrist. In 1976 Dr. Forte chose to go Navy because "I wanted to travel and see some of the world, and the Navy seemed the way to do this."

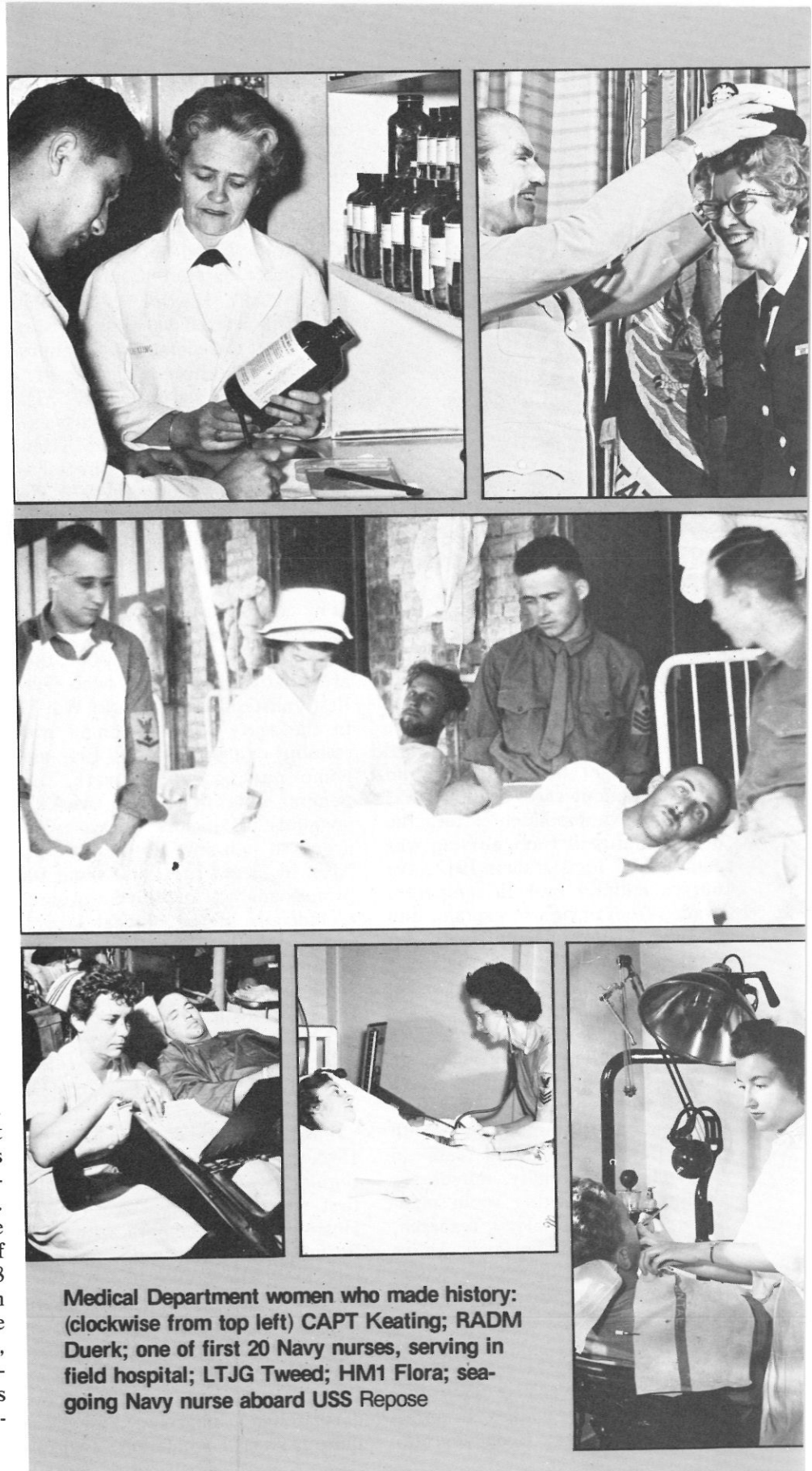
"Being the first black woman in Navy optometry doesn't bother me," Dr. Forte says. "A lot of times I have found myself looking around for another female optometrist in the office, but I've gotten used to being the only woman on the staff.

"Convincing some men that you are just as competent as they are is sometimes a problem," she notes. "But I feel that my work is respected by the men I work with, and I appreciate that. I'm a female part of the team."

Other memorable Medical Service Corps women include:

- Dr. Mary Faye Keener, a distinguished aviation physiologist, who in 1965 became the first woman MSC officer promoted to the rank of captain while on active duty; she was also the first woman named a fellow of the Aerospace Medicine Association.
- ENS Gale Gordon, an aviation experimental psychologist in the Naval Reserve, who was the first woman to complete flight training in the Navy and win her naval aviator wings.
- LTJG Noreen Considine (MSC), who in 1973 became the Navy's first female industrial hygienist; she is now stationed at the Navy Environmental Health Center in Cincinnati.

The first Navy nurses—all female—were a superintendent, a chief nurse and 18 nurses who in 1908 paid their own way to Washington for entrance examinations. These enterprising women rented a house, established their own messing facility, and began the work that is carried on today by their successors.



Medical Department women who made history: (clockwise from top left) CAPT Keating; RADM Duerk; one of first 20 Navy nurses, serving in field hospital; LTJG Tweed; HM1 Flora; sea-going Navy nurse aboard USS Repose

HN Stevens ensures a baby's first days of life are contented ones

In World War I, more than 1,400 Navy nurses served in medical facilities worldwide, and four nurses won the Navy Cross. Afterwards the number of Navy nurses dropped to less than 500, until World War II again brought them to the front lines of patient care. In those war years and immediately after, the official status of Navy nursing was established: legislation in 1942 gave nurses military rank in temporary grades from ensign to captain, and in 1947 the Army-Navy Nurse Act established the Nurse Corps as a staff corps and authorized permanent commissioned rank.

Male nurses came on board in 1965, but women still make up nearly 82% of the corps. Navy nurses are involved in all areas of inpatient and ambulatory health care. Besides providing care in every clinical specialty, nurses are assigned to operating room management, anesthesiology, research, teaching and administration. An increasing number of nurses devote their energies to providing primary care in clinics and outpatient services.

Top executives. In recent years Navy nurses have seized opportunities to assume new roles as nurse practitioners, nurse midwives, administrators of Navy medical facilities, and top Medical Department executives. CAPT Bernadette McKay was the first Nurse Corps officer to be named director of administrative services at a Navy health care facility, assuming that role in 1975 at the Naval Submarine Medical Center, Groton, Conn. Also in 1975, CAPT Harriet A. Simmons reported to the naval clinic in Mayport, Fla., to become the first nurse serving as officer-in-charge of a Navy health care facility. The Navy's first woman admiral was a Nurse Corps officer: RADM Alene B. Duerk (NC), named director of the Navy Nurse Corps in 1972. Her successor, RADM Maxine Conder (NC), now heads a Nurse Corps comprising more than 2,500 officers.

In the Hospital Corps, too, women provide such vital service that it's hard to remember they are relative newcomers who were first enlisted during World War II. In the early 1940's, women with training or experience in first aid, home nursing, social work, and general duty or clerical work in hospitals or doctors' offices were urged to join the Hospital Corps. Also, by December 1942, some 100 professionally qualified women technicians in the clinical laboratory, dental technology, X-ray, physical therapy and occupational therapy fields had enlisted. In 1944 the first Hospital Corps school for WAVES was commissioned at National Naval Medical Center and accepted a charter class of 230 enlisted women.

Public Law 625, approved 12 June 1948, made the WAVES part of the regular Navy. That same day, the first six women were sworn in as Hospital Corps members, with HM1 Ruth Flora the first in this group to take the oath of office.

Today, women may serve in all Hospital Corps specialties except those identified with combat vessels. Hospital Corps women work as X-ray, laboratory, ophthalmology, dermatology, pharmacy, physical therapy and inhalation therapy technicians, as well as in many other essential health care jobs. Many Hospital Corps women advance into more specialized fields of health care, and some, like LT Donna R. Martin (MSC), obtain college degrees and accept commissions as Medical Department officers. LT Martin's appointment as ensign in 1971 marked the first time an enlisted Hospital Corps woman was selected through the in-service program for commissioning in the Medical Service Corps Health Care Administration Section.

A little extra. The highest ranking woman in the Hospital Corps today is HMCM Ann Mariotto, assistant chief of the Military Personnel Service at Naval Regional Medical Center Bremerton, Wash. "I found out one thing early in the Navy," Master Chief Mariotto says. "If you do your work and you're willing to do a little extra, you'll be accepted."

Master Chief Mariotto attributes her successful career to her willingness to do whatever her job required. "I've always performed the duties of my rate. Also, I've had officers and chiefs who gave me a fair deal." She also believes she got a lucky break: "When I enlisted in 1958, I had a little lab training and the Navy needed lab technicians, so I ended up working in a 'male' field. I was never limited to ward duty."

"In 1960 I put in for radioisotope school," she remembers. "I got back a letter saying I couldn't go, due to the minimal need for women in radioisotope training. But since then, there's been great improvement in what Hospital Corps women are allowed to do."

Master Chief Mariotto—and other Medical Department women—still cannot be assigned to a warship or to combat duty. But even with that one restriction, there are innumerable opportunities for women to serve and to grow professionally in the Navy health care system. The rewards are great: as CDR Martinson of NRMC Long Beach says, "I wouldn't trade what I've got with anybody."

Policy

How Medical Department Officers Are Assigned

Medical Department officer assignment policies are based on the Bureau of Naval Personnel (BUPERS) Manual, BUPERS instructions and directives, Secretary of the Navy instructions, and permanent change of station move limitations directed because of fiscal constraints. There continue to be many requests for exemption from assignment policies. BUMED detailers intend to assign each officer fairly by adhering to the sound management policies explained below:

- Decisions on assignment of Medical Department officers must be based on the needs of the Navy as demonstrated by a valid, vacant billet; the officer's career development; and the Officer's Preference and Personal Information Card. Once an officer has been notified of intent to issue orders, requests to cancel or modify those orders are considered requests for exemption from assignment policy.
- Medical Department officers will not be considered for reassignment until they have a valid projected rotation date. Tour lengths are determined and projected rotation dates assigned in accord with BUPERS policy: normal tours for lieutenant commander and above are 3 to 4 years; tours for lieutenant and below are 2 to 3 years.
- Assignments entailing cross-country moves will normally be limited to the few situations in which no other qualified officer is available to fill a vacant billet. Occasionally cross-country moves may be authorized to meet Navy needs.
- Assignment to an overseas facility will be limited to unaccompanied officers and officers with no more than three dependents. However, officers with children or dependent parents are not exempt from assignment overseas. Overseas tours commence on the day officers leave the continental U.S. Hawaii and Alaska are considered overseas tours.
- To promote command stability and maintain adequate staffing levels, BUMED usually will not endorse a request for reassignment until the officer has completed at least one year at a duty station.
- When reassignment is requested before a regular rotation date because of a documented hardship, no-cost-to-the-government orders may be issued, unless the officer is approaching a valid projected rotation date when he or she makes the request. Requests for no-cost orders will not be favorably endorsed for any reason other than a documented hardship.
- Requests to change a projected rotation date must be made in writing, via the chain of command, six months before the normal projected rotation date. Specific reasons for such a request must be given, particularly if an extension of the normal, established tour length is involved. Requests to extend overseas tours beyond 48 months must be favorably endorsed by an appropriate flag or general officer in the field; merely indicating this endorsement on a preference card is not sufficient. Lengthy extensions of tours in especially desirable areas normally will not be granted. To do so would delay or negate another officer's opportunity for such an assignment.
- Approval of a request for transfer or extension will not be granted at the expense of the career needs of another officer.
- Married officers may anticipate assignment to the same location as their spouse provided there is a valid, vacant billet for which they are qualified, and provided there is a need to have the billet filled. However, the fact that an officer is married cannot be the determining factor in his or her assignments. To assist detailers in responding to requests for concurrent duty, a military married couple must notify their respective detailers as soon as possible of a move projected for either member.
- Medical Department officers should submit requests for extension of active duty to the Chief of Naval Personnel, via BUMED (Code 312), at least eight months but no later than three months before their normal release from active duty date.
- Reserve officers appointed before their 26th birthday are not eligible to resign until the sixth anniversary of their original commissioning date. They may request release from active duty prior to that time if they have fulfilled all commitments incurred as a result of Navy-subsidized education, an initial active-duty obligation, an extension of active duty, or another commitment to serve on active duty. For details, see BUPERS Manual, Article 3830100.
- Early release for the purpose of entering graduate medical education is not being granted by the Chief of Naval Personnel (see ALNAV 082/76).
- An officer is not eligible to resign until two years from the date he or she accepted a regular Navy commission as a result of an augmentation request.
- A request for resignation or retirement will not be considered until the officer has completed one year at a duty station in the continental U.S., or, if assigned overseas, until completion of that tour.

Policies regarding augmentation are discussed in BUPERS Manual, Article 1020120. Policies on separation of dependent and pregnant members can be reviewed in BUPERS Manual, Article 3810170.

All Medical Department officers should give assignment officers current, pertinent information that might affect their assignability. Medical officers should ensure that their commands forward copies of reporting and detachment endorsements, acceptances of augmentation, and promotion appointments to BUMED (Code 312). Information which should be provided in the "Remarks" section of an updated preference card includes: number and age of children; spouse's name, occupation (if civilian), rank/rate year group, social security number, designator, rotation date, duty station, and name and telephone number of detailer; spouse's school completion date (if a student); spouse's estimated dates of hospitalization, if pregnant.

Because assignments are planned and nominations made as much as six to nine months before the projected rotation date, early submission of the Officer Preference and Personal Information Card is imperative. The number of Medical Department officers married to other active-duty military members is increasing steadily; officers anticipating marriage should remember that assignment to the same duty station as their spouse cannot be guaranteed because limitations on Medical Department strength do not permit assignment in excess of allowance.

Commands are requested to disseminate this information to all Medical Department officers.—BUMED Code 3.

BUMED SITREP

FROM ARMY TO NAVY . . . Naval Regional Medical Center Yokosuka, Japan, has taken over operation of the Army laboratory at Sagami-Ono near Camp Zama. This facility, which provides laboratory support for all military medical activities in the Far East, includes a blood bank and blood distribution center, a drug screening section, and chemistry, pathology, entomology, and microbiology departments. There are also sections for research in veterinary medicine, food inspection, and sanitation. CDR Stuart H. Myster (MC), designated officer-in-charge, will supervise a staff of nine Navy officers, 29 enlisted personnel, and 84 civilians.

NEW FLAGS . . . Six Medical Department officers have been selected for flag rank. The new rear admiral selectees are Eustine P. Rucci, George E. Gorsuch, and Roger F. Milnes from the Medical Corps, Julian J. Thomas, Jr., from the Dental Corps, and Naval Reservists Matthias H. Backer, Jr. (MC) and William J.H. Vaughn (DC). Watch for details next month in *U.S. Navy Medicine*.

NEW PARASITE IDENTIFIED . . . Navy scientists have isolated and identified the adult worm of a previously unknown filarial parasite that causes elephantiasis. Investigators at the Naval Medical Research Unit No. 2 detachment in Jakarta, Indonesia, have developed animal models for the filaria, named *Brugia timori*, as well as for *Brugia malayi*, one of two other filariae which infect humans. Using these models, researchers will learn more about the pathophysiology of filariasis, test chemotherapeutic agents, and develop a vaccine to protect people from filariasis infection.

OPTOMETRY BILLETS RESTORED . . . Nineteen Medical Service Corps active-duty optometry billets deleted from the Medical Department's FY77 budget have been restored. This increase in optometrists will enable the Medical Department to provide optometric services at former levels to all eligible beneficiaries.

It will take some time to recruit optometrists to fill the 19 billets; as new optometry officers are obtained, they will be assigned to activities with the greatest need.

STAMP OF APPROVAL . . . The Ocular Technician School at the Naval School of Health Sciences in San Diego has been accredited by the Joint Commission on Allied Health Personnel in Ophthalmology. Accreditation means that Navy-trained ocular technicians meet standards set by the Commission, an independent group of eight physicians from national and international ophthalmology societies.

AUDIT TIPS . . . Navy medical facilities can conserve energy by:

- Closing areas that are seldom used.
- Reducing use of electricity for lighting and ventilation.
- Encouraging employees to form carpools and thus save fuel.

TOP NOTCH DESIGN . . . This branch clinic in the headquarters area of Marine Corps Base Camp Pendleton, Calif., was one of six new military buildings to win a DOD 1976 Design Award for Military Construction. Competition judges praised the clearly organized plan and imaginative landscaping of the year-old facility.

Enlisted Scene

NOTAP: WHAT'S IT ALL ABOUT?

It sometimes seems that the same personnel research programs, like cookbooks, keep reappearing with new titles, and that the researchers promise better results by using new techniques on the same old ingredients. Why, then, should the Navy Occupational Task Analysis Program (NOTAP) offer anything new in personnel research? Many similar programs were funded in recent years and yielded much useful data, but most of these research efforts concentrated on a specific matter, not on Navy occupations in general or on long-range planning. Because each research group operated separately there was little standardization in the work, so it was difficult to apply the methods and findings of one research project to another.

Recognizing the need for comprehensive occupational task analysis data which could be adapted to continuing needs, the Bureau of Naval Personnel (BUPERS) established NOTAP to collect and analyze data on Navy occupations. Later NOTAP and the BUPERS Occupational Standards Department were combined under the Navy Occupational Development and Analysis Center (NODAC), which is now analyzing tasks to develop better personnel classification systems. Every Navy enlisted rating will be analyzed and a data bank developed for use by personnel program managers.

On 4 Jan 1977 the Navy Surgeon General approved NODAC's request to analyze Hospital Corps tasks. The hospital corpsman rating, which comprises many people, specializations, and commitments, is one of the most complicated Navy enlisted ratings, and will become even more complex as advancing technology brings increasing demands for specialized skills. How can the Hospital Corps satisfy everyone, yet maintain general rating skills, support the operating forces, and remain ready for combat? To answer this question, we need all the help we can get. NOTAP may provide that help.

Will the results of NOTAP be worth the effort involved? Should we spend this much of our time and resources to learn more about what hospital corpsmen actually do on the job? The answer is *yes*—if the product of this research will permit us to interpret problems better and make informed changes. No lesser result should be acceptable.

BUMED Notice 1223 of 18 Feb 1977 outlines the Hospital Corps NOTAP project. Questions may be directed to LCDR E.M. Knodle (MSC), BUMED's NOTAP project officer, or to HMCM F.A. Burkhart, at Autovon 294-4682.

CORPSMEN, DENTAL TECHS NOW IN CREO GROUP D

Hospital corpsmen and dental technicians may find it easier to reenlist or extend their enlistment now that their ratings are included in CREO (Career Reenlistment Objectives) Group D. While Group D ratings are 100% manned and there are some reenlistment and extension restrictions, these restrictions aren't as severe as those imposed on Group E ratings.

HM and DT ratings were formerly in Group E, which comprises severely overmanned ratings whose members could not reenlist or extend their enlistment without approval from the Bureau of Naval Personnel (BUPERS).

The CREO Program began in 1972 with three objectives:

- To place more personnel in undermanned ratings (CREO Groups A and B).
- To reduce the number of personnel in overmanned or filled ratings (Groups D and E).
- To provide attractive career patterns more useful to the Navy.

To carry out the objectives, BUPERS developed rating profiles which described the optimum distribution of personnel by pay grade and length of service. Current management efforts aim to move Group A, B, and D ratings into Group C, representing ideal personnel balances. Details on the CREO program are in BUPERS Instruction 133.25C (Change 2).

NAVY DENTAL TECHNICIANS

April 2, 1948-1977

It is with pleasure that congratulations and best wishes are extended to you on the occasion of the Twenty-ninth Anniversary of the Dental Technician Rating.

On April 2, 1948 the dental technician rating came into being when 1,600 hospital corpsman, who had been trained in dental assisting and technology, sewed on the rating badge of the now familiar caduceus with a superimposed "D."

Since this beginning, your deeds of valor, devotion to duty and skillful and innovative accomplishments have contributed greatly to the high standards of dental care provided by the Navy Dental Corps. Further, during the past year a substantial increase in the amount of dental care provided has been realized, without an increase in personnel. This outstanding achievement can, in large measure, be attributed to your dedication to duty and strong support of the Navy Dental Corps' goal of reducing dental disease.

On behalf of all of us in the Navy Medical Department, "Well Done" and Happy Anniversary.

R. W. ELLIOTT, Jr.
Rear Admiral, DC, USN
Assistant Chief for Dentistry
and Chief, Dental Division

W. P. ARENTZEN
Vice Admiral, MC, USN
Surgeon General

NAVMED Newsmakers

When Sherry Hogan, pregnant wife of Navy construction electrician John Hogan, began to have labor pains, she immediately boarded an aeromedical evacuation flight bound for NRMC Naples, Italy. But even that wasn't fast enough for Sherry's daughter, who was born in the aircraft 20 miles south of Naples. LCDR **Gerald Ross** (MC) and LT **Barbara Brake** (NC) handled the mid-air delivery, with the aid of the flight attendant HM1 **Joseph Wooldridge.**

As leading petty officer in the USS *Kalamazoo* medical department, HM2 **Robert W. Johnson** is used to "putting out fires" when medical problems arise. But after his day aboard the *Kalamazoo* ends, the energetic corpsman quickly changes his clothes and goes to fight real fires—with the Jacksonville, Fla., fire department. A volunteer firefighter when his ship is in port, HM2 Johnson uses his six years of Navy medical experience in treating smoke inhalation and injuries.

Some people jog. Others do calisthenics. But HM3 **Maurice Orange** of NRMC San Diego prefers a more exotic method of keeping in shape—Tae Kwon Do, a Korean style of karate. In just four months the young corpsman became so proficient he finished first in the lightweight division at a local competition. His goals: to attain black belt status and to win a spot on the military team that competes in the Olympics.

They faced each other, right hands raised, he repeating the words she spoke. Then he signed on the dotted line, and she did the same. "Congratulations, Chief husband," she said. "Thank you, Lieutenant wife," he replied. Senior Chief Electrician's Mate Juan Victor Ruiz had just reenlisted in the Navy for four years, while his wife, LT **Ceferina P. Ruiz** (MC), officiated. A physician assigned to the branch clinic, Naval Training Center, San Diego, LT Ruiz met her future husband when both were second-graders in the Philippines, and joined him in the Navy in 1975.

HM2 Johnson: Ready when problems arise

HMCS DuFrain with Drs. Hilton (left) and Morgan

HMCS **Larry DuFrain** was tops in Navy medical recruiting during FY76, bringing on board seven new Navy physicians and five nurses. Since reporting to Navy Recruiting District, Denver, two and a half years ago, he has recruited 18 physicians and many other Medical Department personnel. Two recent discoveries: **Saskia C. Hilton,** M.D., a pediatric radiologist who will be stationed with her Navy physician husband at NRMC San Diego; and **Candice A. Morgan,** M.D., a proficient scuba diver and pilot, who will train in aerospace medicine.

Language proved no barrier when three Navy nurses from the branch clinic at Sasebo, Japan, met with local colleagues to discuss rehabilitating the handicapped. Dr. Naoya Hara served as interpreter while escorting CDR **Alyce M. Hines** and LTs **Ann Steffans** and **Christine Hoyle** through National East Saga Hospital. Among the problems common to the U.S. and Japan discussed during the nurses' visit was the need for greater public acceptance of handicapped people.

Professional

A Custom Staining Technique for Natural-Looking Ceramic Restorations

LT Paul E. Schmid, DC, USNR

In modern dental restorative procedures, the emphasis is on aesthetics. Unacceptable aesthetics translates directly into failure of the prosthesis, because today's patients insist that their prostheses look natural. While proper fit, contour and occlusion are certainly vital components of a permanently successful prosthesis, the patient's immediate concern is the appearance of the restoration.

Making a veneer simulate the appearance, characteristics, texture and color of a tooth can be difficult, and perfectly matching a patient's natural teeth may be impossible. For example, in a study of shade matching, Culpepper (*1*) found that because critical color perception varies from one individual to another, dentists often disagree when selecting a match for natural tooth shades. In fact, of the 37 dentists who participated in Culpepper's study, no more than 39% agreed on any single match for natural teeth when selecting colors from a shade guide. Some dentists were not able to reliably duplicate their shade selections from one time to another. Thus, even when the dentist has taken great care in selecting and applying the proper body shade of porcelain, once viewed in the patient's mouth the restoration may need further laboratory attention to be aesthetically acceptable.

In staining, today's ceramic technology gives us a tool which can make the difference between a mediocre and a gratifying aesthetic result. Stains can be used to correct an improperly selected basic shade, to match a tooth for which there is no accurate shade guide, to reproduce special tooth characteristics, to adjust the blend on incisal areas, to mask out dirt and bright spots, and to control excess translucency. While there is no substitute for correct basic gingival and incisal colors in ceramic prostheses, stains can be used to increase the saturation of a color or to change the hue. But there are limits to what staining can do: it is difficult, if not impossible, to decrease the saturation of the color or increase the lightness of a porcelain crown or facing (*2*).

A true mineral stain affects the outer layer of porcelain. These surface stains are not widely used because they are soon worn away in areas exposed to excessive wear or attrition (*3*). More universally used are stains composed of colored, low-fusing porcelain. The stain is used in finely powdered form. This powder is suspended in water, glycerin and water, or a similar liquid which completely volatilizes during firing (*4*). Colored metallic oxides are added for pigment. Specific colors such as white are created with oxides of zirconia, and in some cases with oxides of alumina and silica. Yellows are made with pigments that contain vanadium, or from titanium oxide combined with a little chromium. Pink is difficult to produce because of the high firing temperatures required, but colloidal gold may be used in its place. Black comes from modified iron oxide, and blue from cobalt salts (*2*).

Generally, when self-glazing ceramics are used for a veneer or jacket crown, stains may be applied before the final firing—or at the biscuit bake if the stains have a fusion point close to the glazing temperature of the porcelain (*2*). For example, when Steele's Super Stain (fusing temperature 1762° F.) is used on a Ceramco porcelain (self-glazing at approximately 1800° F.) the stain will fuse and melt into the porcelain; in this case an overglaze layer is rarely required, but can be used to obtain an illusion of depth (*2*).

LT Schmid is on the staff of the Dental Department, USS *Shenandoah* (AD-26), FPO New York 09501.

If a non-self-glazing porcelain is used, or if stains are applied to a previously glazed surface, or if the fusing point of the stain is not close to the glazing temperature of the porcelain, then an overglaze layer must be applied after the stain layer has been fired. This overglaze protects the newly applied stain and produces an even, glossy sheen on the surface of the restoration, consistent with natural aesthetics. Stains are applied by mixing pigmented porcelain powder with the liquid medium and painting this mixture on the restoration with a fine red sable brush. If the desired effect is not created, the stain can simply be wiped off and staining begun again (*5*).

PRINCIPLES OF COLOR

Color has three fundamental attributes: hue, brightness, and saturation. Hue, or basic color, is the quality of sensation through which an observer is aware that one color is green and another is red. Brightness, or value, indicates the amount of light reflected from a surface, and is the quality that enables us to distinguish a light color from a dark one.

The extremes of brightness are black (0 on the value scale) and white (100 on the value scale), while gray represents intermediate brightness. The brightness of a color is determined by which gray on the value scale it matches in lightness or darkness. Every porcelain shade has a numerical value on the brightness scale; Ceramco white modifier, for example, has a value of 71, and Ceramco gray modifier has a brightness of 39, with the remaining body shades falling between these two values. Any attempt to darken a tooth shade by adding gray will not succeed if the added gray is higher on the brightness scale than the original shade. For example, if the color to be darkened has a brightness value below that of medium gray, and a gray brighter than medium is added, the result will be increased brillance: the tooth shade will lighten rather than darken (*6*).

The third attribute of color—saturation, or chroma—is that property which makes one sample of a hue appear more intense or pure than a second sample. Chroma describes the amount of hue in a color and is the quality which distinguishes a strong color from a weak one.

Hue, brightness, and saturation may be used to describe completely the color of any object. For example, the incisal edge of a tooth may lack brightness and be gray in color. But toward the gingival third of the tooth the enamel becomes thinner and light is reflected from the basically yellow dentin core; here the hue changes to yellow, becoming progressively more saturated (*7*).

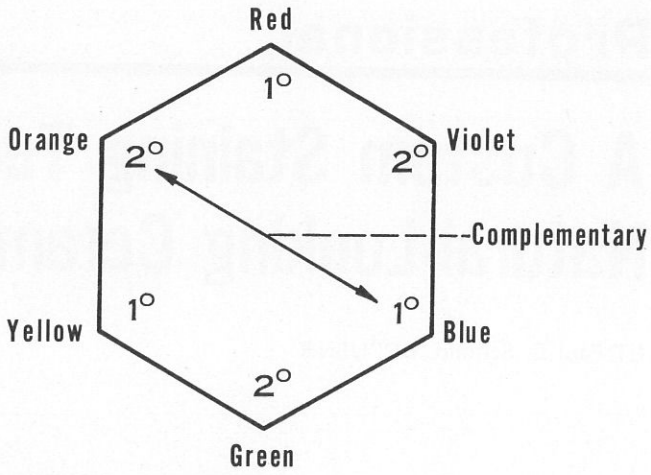


FIGURE 1. Color wheel.

The primary colors red, yellow, and blue can be blended to create the secondary colors green, violet and orange, as illustrated in the color wheel in Figure 1. The color directly opposite another on the wheel is called a complementary color.

Because the basic hue of a tooth is yellow, the color can deviate in only three ways: in hue, by being a reddish-yellow (orange) or a greenish-yellow; in brightness, by reflecting more or less light than a medium gray; and in saturation, by being a stronger or weaker yellow (*7*). Staining adds color, neutralizes excessive color, or reduces brightness when porcelain has too much white and is too bright (*8*).

Color can be added in several ways: For example, if the nearest shade of porcelain powder that can be found to match a natural tooth is too orange because it contains too much red, the hue can be changed by adding a slightly brighter, yellow-green porcelain stain; the green cancels the effect of red and produces a gray color (*7*). The addition of gray to the incisal shade can turn the darker yellow shades green, since gray acts on yellow in the same way blue acts on yellow to form green. But the addition of violet will neutralize the yellow and yield gray, with less of the greenish effect that can ruin a natural appearance.

Occasionally, too much color is built into the porcelain. Blending complementary colors has a neutralizing effect: if complementary hues of unequal chroma or saturation are blended, the dominant color's brightness is diminished and the color becomes grayer. If complementary hues of equal chroma and value are blended, a neutral gray is created (*6*).

Gray should be added to reduce brightness when little yellow is present. If a shade with prominent yellow must be darkened, the overlay should be brown to avoid a greenish tinge. To decrease the saturation of color, a more saturated modifier of the same hue and brightness should be added.

In addition to changing color, various stains can be used to individualize restorations and to reproduce on a porcelain restoration the distinctive characteristics of the natural tooth. First, a color distribution chart of the natural tooth's labial surface should be drawn to exact anatomic form and divided into thirds incisocervically and mesiodistally (Figure 2). This chart will assist in locating and appraising the irregular border where the gingival color overlaps the mesial and distal surfaces and blends with the incisal shade. Areas of incisal translucence can be identified on the chart, as can calcified areas, hairline cracks and stains. The chart should list every surface characteristic and irregularity that must be reproduced in the restoration to achieve an aesthetically pleasing, harmonious result (*7*). Using the chart as a placement guide, stains can be used to simulate the following:

- **Hairline crack**, simulated by applying brown stain mixed with a little black stain. The mixture is applied first in a wide strip on the labial surface; then, with a fine pointed brush, the sides of the line are gradually brushed away until only a very fine, not always continuous line remains.
- **Incisal wear**, simulated by selective grinding in the central area of the incisal edge of the crown to duplicate wear, and staining the area with a mixture of one part yellow, one part brown, and two parts diluent. The center of the stained area may be undiluted brown, simulating the exposed and more heavily stained dentin.
- **Cervical stain**, made by reproducing any surface or contour changes in the porcelain which may have been made by recession or abrasion, then by staining such areas with a mixture of three parts brown, one part yellow and four parts diluent. Areas of darker brown can be reproduced by placing small dots of brown stain on the wet surface and feathering the edges with a fine brush.
- **Decalcified areas**, made by forming a small irregular depression in the porcelain. A thick layer of opaque white stain, alone or with a trace of yellow, brown, or gray, is poured into the depression (*2*).
- **Grooves and pits on an occlusal surface**. Fine lines of brown stain with a small quantity of black are applied to the occlusal surface.
- **Silicate restoration**. A line of brown or gray stain, representing the outline of the restoration, is first painted on the labial line angle. This line is narrowed and the portion inside the line is covered with opaque white mixed with gray, yellow, brown, or a combination of these three colors.
- **Amalgam restoration**. A line of gray stain is placed on the proximal line angle and feathered over 2 mm to give the appearance of the stain that results from an alloy restoration (*2*).

The creation of natural-appearing porcelain veneers is an art which can be mastered only with a thorough understanding of colors and their modification, and with practical experience in the laboratory. Proficiency in staining may be obtained by sandblasting a porcelain denture tooth and practicing different modifications. One should always strive to build the proper shade and value into the veneer in its fabrication; however, the custom touch that staining can add to create a natural-appearing restoration will be a source of pride to patient and dentist alike.

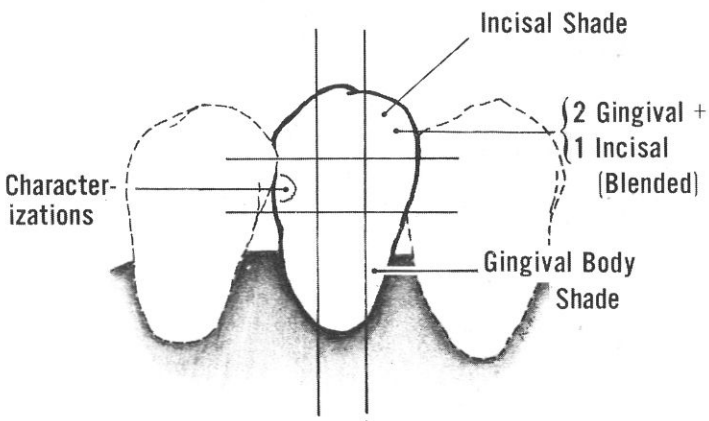


FIGURE 2. Color distribution of natural tooth's labial surface.

REFERENCES

1. Culpepper WD: A comparative study of shade matching procedures. J Prosthet Dent 24(2):173, 1970.

2. Johnston JF, Mumford G, Dykema RW: *Modern Practice in Dental Ceramics*. Philadelphia: W.B. Saunders Co, 1967.

3. Tylman S: *Theory and Practice of Crown and Fixed Partial Prosthodontics (Bridge)*. St. Louis: C.V. Mosby Co, 1970.

4. Skinner EW, Phillips RW: *The Science of Dental Materials*. Philadelphia: W.B. Saunders Co, 1976.

5. Richardson JT, Gardner MF: Contouring and staining ceramic-metal restorations in the mouth. J Prosthet Dent 33(6):639, 1975.

6. Kornfeld M: *Mouth Rehabilitation: Clinical and Laboratory Procedures*. St. Louis: C.V. Mosby Co, 1974.

7. Johnston JF, Phillips RW, Dykema RW: *Modern Practice in Crown and Bridge Prosthodontics*. Philadelphia: W.B. Saunders Co, 1971.

8. Granger RG: Dynamic esthetics in porcelain-veneered fixed prostheses. J Prosthet Dent 32(5):541-542, 1974.

Clinicopathological Study of Aortic Valve Replacement

ENS Felipe C. Robinson, USNR

Management of far-advanced aortic valve disease has progressed considerably since Harken and his colleagues introduced the ball-valve prosthesis in 1960 (*1*). Many new valves have been developed using both artificial and biological materials. Although the designs of the valves vary, they generally conform to the criteria Harken (*2*) outlined for an optimal prosthetic heart valve:

- lasting physical and geometric features.
- capability of permanent implantation in the normal anatomic valve site.
- chemically inert.
- non-thrombogenic.
- harmless to blood elements.
- adequate opening and closing during the appropriate phase of the cardiac cycle.
- offering no resistance to physiologic flow.

Although no single approach has been satisfactory in all situations (*3*), over the past 10 years the Starr-Edwards series 2300 cloth-covered aortic valve has been by far the most commonly used prosthesis for treating aortic valve disease.

This valve has been the most commonly used aortic prosthesis at the University of Florida College of Medicine in Gainesville (Figure 1), where from 1969 to 1975, in the J. Hillis Miller Health Center, 223 patients have undergone aortic valve replacement with the composite-seat, cloth-covered, Model 2310 and 2320 Starr-Edwards aortic valve prosthesis (3M-Starr Edwards). Because late complications have been attributed to this prosthesis, 10 randomly selected surgical pathology and postmortem records, as well as associated clinical records, were analyzed for evidence of mechanical or biogenic disruption. The purpose of this study was to determine the effectiveness and durability of the valves, and to compare the results of this analysis with other studies of prosthetic aortic valve efficacy.

ENS Robinson is a medical student at the University of Florida in Gainesville. His address is: Box J-719, J. Hillis Miller Health Center, Gainesville, Fla. 32610.

The author thanks George Daicoff, M.D., chief of thoracic and cardiovascular surgery at the University of Florida College of Medicine, for guidance during this study and for assistance in preparing this report.

METHOD

Surgical pathology and postmortem records and associated clinical records of ten randomly selected patients were analyzed. Nine of these ten patients had died at least two months after their aortic valve was replaced. One patient was selected from a group who survived replacement of a dysfunctional Starr-Edwards valve. The age and sex of the patients and the site of replaced valves are shown in Table I. All patients were in functional classes III or IV of the New York Heart Association classification before their operation. All patients were male. Ages ranged from 29 to 70 years (average 49 years).

Table II shows the preoperative valvular lesions, etiology of the lesions, and for the nine deceased patients, the cause of death. The etiology of the valvular lesions varied. Four patients had diagnosed

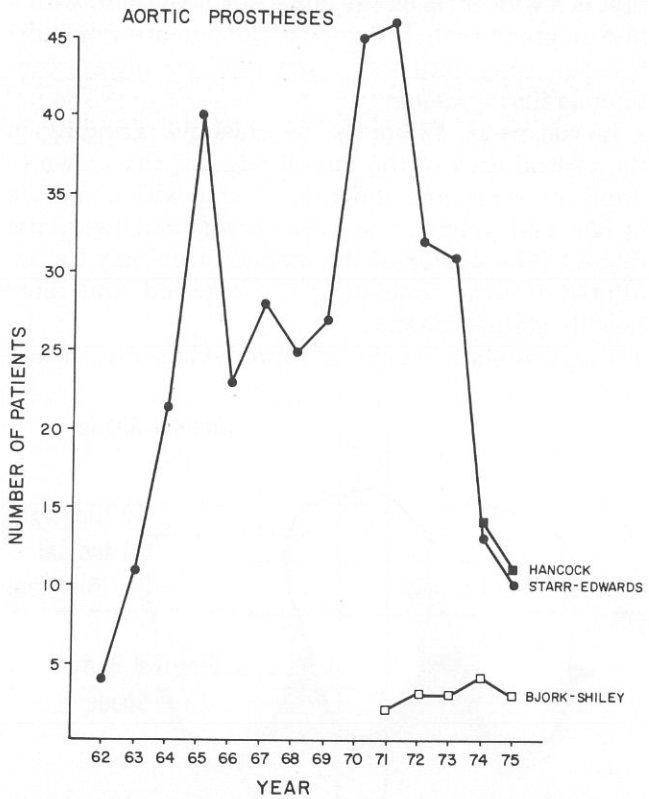


FIGURE 1. Prosthetic valves implanted at the University of Florida College of Medicine between 1962 and 1975.

aortic insufficiency and aortic stenosis secondary to rheumatic heart disease. Two patients had preoperative diagnoses of aortic insufficiency and aortic stenosis secondary to bacterial endocarditis; another two had a congenitally malformed bicuspid aortic valve. One patient had aortic stenosis secondary to atherosclerosis. The tenth patient had syphilis.

In replacing the valves, standard techniques of cardiopulmonary bypass had been used, with a roller pump, bubble or disc oxygenator, and moderate whole body hypothermia (30° C). Topical 4° C iced saline lavage was also used in some patients to protect the myocardium. Aortic defibrillation and cross-clamping were sometimes used. Standard doses of sodium warfarin or a combination of acetylsalicylic acid and dipyridamole were given to prevent postoperative thromboembolism.

TABLE I. Identification and Survival Time of Patients with Starr-Edwards Series 2300 Prosthetic Aortic Valve

Specimen	Size	Model No.	Sex	Race	Age	In vivo duration
N.C.	9A	2320	M	W	53	5
J.F.	9A	2320	M	W	29	15*
B.E.	10A	2320	M	W	63	24
T.S.	10A	2320	M	B	48	19
J.M.F.	9A	2320	M	W	36	8
J.M.	10A	2320	M	W	62	48
G.R.	9A	2320	M	W	70	28
J.C.	10A	2320	M	W	44	25
J.N.C.	12A	2310	M	B	65	3
O.T.	13A	2320	M	B	33	24

*Valve replaced by Hancock valve

TABLE II. Diagnosis, Etiology of Disease, and Cause of Death of Patients in Study

Patient	Pre-surgery diagnosis	Etiology	Cause of death
N.C.	Aortic insufficiency and aortic stenosis	Secondary to bacterial endocarditis	Secondary to bacterial endocarditis
J.F.	Aortic insufficiency and aortic stenosis	Congenital malformation	Surviving patient
B.E.	Aortic insufficiency and aortic stenosis	Secondary to bacterial endocarditis	Iatrogenic aortic laceration
T.S.	Aortic insufficiency and aortic stenosis	Rheumatic heart disease	Intraoperative demise during replacement of prosthesis
J.M.F.	Aortic insufficiency and aortic stenosis	Rheumatic heart disease	Sepsis
J.M.	Aortic stenosis	Atherosclerosis	Interstitial pneumonitis
G.R.	Aortic insufficiency and aortic stenosis	Congenital malformation	Cardiovascular arrest
J.C.	Myocardial insufficiency, aortic insufficiency and aortic stenosis	Rheumatic heart disease	Cardiogenic shock
J.N.C.	Aortic stenosis	Syphilis	Mycotic sepsis
O.T.	Aortic insufficiency and aortic stenosis	Rheumatic heart disease	Myocardial infarction

ILLUSTRATIVE REPORTS

Patient 1. J.F., a 29-year-old white male who is an inmate in a correctional institute, had a six-year history of progressive shortness of breath, dyspnea on exertion, and insidious increase in heart size. There was no history of rheumatic heart disease. Cardiac catheterization in June 1973 revealed substantial aortic insufficiency and aortic stenosis, and the patient was assessed to be in functional class III of the N.Y. Heart Association classification. At surgery one month later, a heavily calcified bicuspid aortic valve with an approximately 6 mm orifice was found. The aortic valve was replaced with a size 9A, fabric-covered Starr-Edwards prosthesis in an operation that required 93 minutes of cardiopulmonary bypass. The patient tolerated the procedure well. His hospital course was unremarkable and he was discharged seven days after surgery.

At six weeks after surgery, the patient was asymptomatic (Figure 2). At the end of his first postoperative year, he complained of "weakness" and shortness of breath. Cardiac catheterization 14 months after surgery revealed significant residual aortic stenosis; laboratory studies before catheterization revealed a hematocrit of 25% and a reticulocyte count of 5.1% (corrected), suggesting hemolytic anemia and dysfunction of the prosthetic valve.

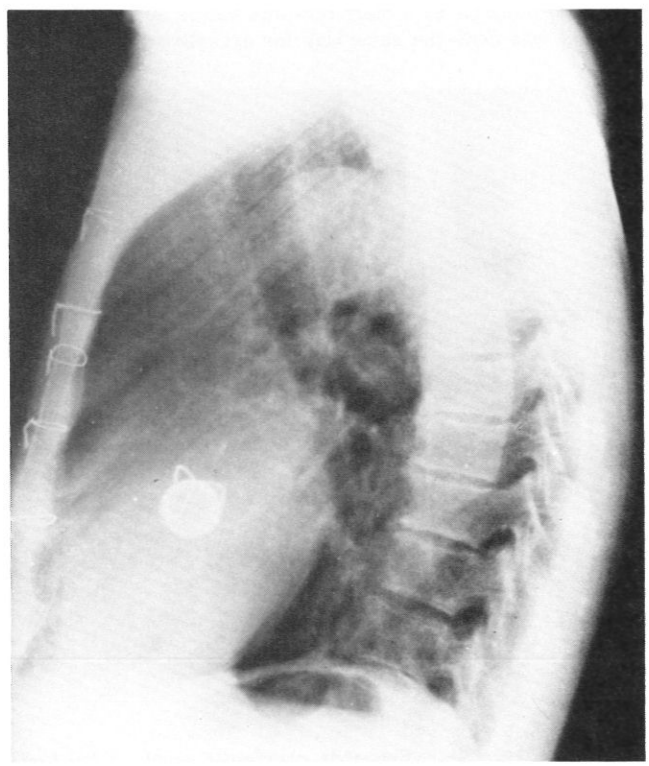


FIGURE 2. Prosthetic valve is seen in situ in this photograph of a lateral chest X-ray taken six weeks postoperatively.

At subsequent surgery, the fabric on the struts of the valve was found to be ruptured and significant amounts of pannus had formed around the orifice of the valve, creating a stenotic outflow tract. The valve was removed (Figure 3) and replaced by a Hancock porcine heterograft. The patient's postoperative course was complicated by development of heart failure and a murmur associated with mitral insufficiency; it was postulated that the mitral valve may have been disrupted by efforts to remove fibrous tissue and pannus from around the aortic annulus near the mitral and aortic continuity. Cardiac catheterization confirmed the presence of postoperative iatrogenic mitral insufficiency.

The incision was reopened and a laceration of the mitral valve was sutured. The patient tolerated the procedure well; his postoperative course was uneventful and he was discharged in satisfactory condition.

The patient has been followed in the outpatient clinic and has been asymptomatic throughout the 2½ years since his surgery. Chest roentgenogram has demonstrated a remarkable reduction in heart size toward normal limits. The only sequela is right bundle branch block demonstrated on electrocardiogram. Cardiac auscultation revealed a grade II/VI systolic murmur of blowing character radiating from the apex to the left axilla, indicating some mild residual mitral insufficiency.

Patient 2. N.C. was a 53-year-old white male who was transferred from another hospital to the Shands Teaching Hospital at the J. Hillis Miller Health Center on 22 Oct 1971 with the diagnosis of subacute bacterial endocarditis. The patient had had a heart murmur since childhood with no known rheumatic heart disease or febrile illness. He was asymptomatic until 1962 when he developed shortness of breath, dyspnea and paroxysmal nocturnal dyspnea. In early 1971, the patient experienced anginal pain, dyspnea and easy fatigability. On 16 June 1971, the patient underwent cardiac surgery in which his calcific, stenotic aortic valve was replaced by a Starr-Edwards valve. Successful reexploration was done the same day for excessive bleeding. The patient did well postoperatively. He was placed on digoxin and Coumadin therapy, and discharged. He returned to work in late August 1971.

Three weeks before his present admission, he had some dental work done and soon thereafter complained of headache and chills in the afternoon, with temperature of 101-102° F. The patient's physician drew blood for culture and started him on penicillin. On 4 Oct 1971 the patient had painful swelling of his left hand and right foot, and a blind spot in his left eye. He was hospitalized in St. Petersburg where two of three blood cultures grew diphtheroids. The patient was treated with various antibiotics and prednisone, and transferred to Shands Teaching Hospital.

Cardiac examination on admission to Shands Teaching Hospital revealed a short systolic murmur in addition to the valve murmur. Laboratory studies disclosed the following values: WBC, 20,300/cu mm; hematocrit, 45%; lactic dehydrogenase (LDH), 200; electrolytes within normal limits. The patient was started on Keflin with a subsequent drop in temperature and white blood count. Electrocardiogram showed signs of an old anterior myocardial infarct. The patient was afebrile until 4 Nov 1971; blood cultures grew no organisms.

Intermittent fever was noted on 4 November. The white blood count of 6,600/cu mm gradually increased. A sore left thumb and right calf were interpreted as signs of recurrent septic embolism. Keflin was stopped since it did not seem to control the infection, and more blood cultures were obtained. On 16 November, with the patient's status unchanged, a mycotic aneurysm of the right foot was excised and sent for culture. At midnight on 16 November, the patient developed acute tachycardia, diaphoresis, and shortness of breath with bilateral pulmonary edema. The patient's blood pressure measured 75mm/mercury systolic; the murmur was unchanged. Mild hemoptysis developed on 17 November. Subsequent catheterization ruled out pulmonary embolism or significant aortic regurgitation. After catheterization, the patient was obtunded. Resuscitation measures failed after two hours, and the patient was pronounced dead at 1650 on 17 Nov 1971.

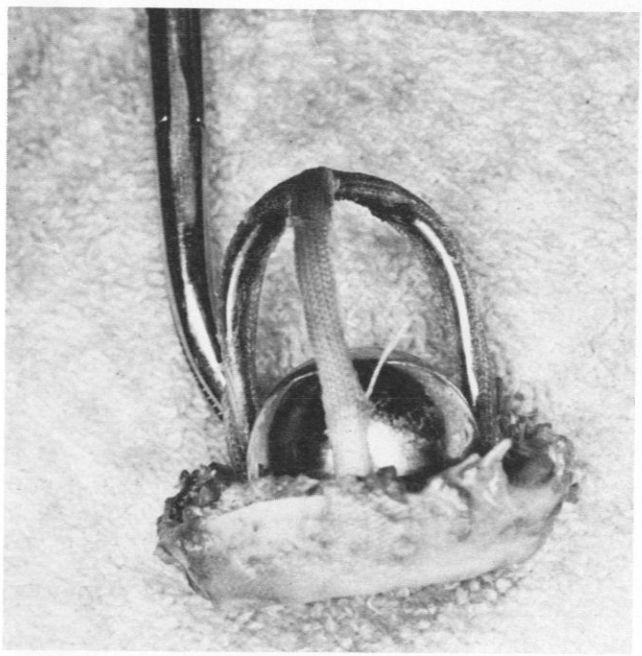


FIGURE 3. This Starr-Edwards prosthetic aortic valve was removed from a patient 15 months after it was implanted. Note the torn strut covering on two of the three sides.

RESULTS

No apparent correlation was found between the etiology of the valvular lesion and how long the patients lived or how long their valves remained functional. Nor was there apparent correlation between length of survival and mortality due to valve dysfunction.

Table III shows pertinent clinical data and describes the valve's condition in each case. Clinical data includes the maximum immediate preoperative serum lactate dehydrogenase (LDH) level, minimum preoperative hematocrit, and maximum preoperative reticulocyte count. Where available, results of blood cultures and serum haptoglobin concentration levels are also shown.

Maximum LDH levels ranged from 276 to 757 units (mean 393.7 units) in patients whose valves demonstrated signs of wear or dysfunction; LDH levels for patients with intact valves ranged from 258 to 511 units (mean 356.3 units). Minimum hemato-

TABLE III. Clinical data and valve description.

Patient	Preoperative Clinical Data Min. Hct	Max. RetC.	Max. LDH	Valve Description
N. C.	30	---	276	Friable adhesions on all sides of annulus and struts with insufficient seating of ball.
	Blood culture grew Diphtheroids			
J. F.	25	5.1	---	Annulus stenosed by fibrosis. Small amounts of fibromuscular tissue adherent to annular base. Cloth rupture evident on struts.
B. E.	28	2.5	406	Paravalvular leak noted. Strut covering torn on two out of three sides. Annular flanges denuded.
J. C.	28	---	---	Valve covered with finely granular vegetative growth on both sides
	Blood culture grew Candida Guilliermoni			
J. N. C.	34	---	511	No ball variance or strut wear noted. No evidence of fibrotic stenosis of annulus.
O. T.	---	---	143	Cloth rupture on two out of three struts. Aortic root graft in place. No apparent wear of orifice or ball variance.
	Haptoglobin 10 mg. %			
T. S.	30	---	330	Strut covering torn on all three sides. Orifice flanges denuded. No evidence of ball variance.
J. M. F.	23	3.3	757	Fibrotic stenosis and calcification of annulus noted with exposure of annular flanges.
J. M.	38	---	450	Calcified annulus. No ball variance or strut wear noted.
G. R.	32	---	258	No evidence of ball variance or strut wear. Diffuse interstitial fibrosis noted in left ventricular myocardium.

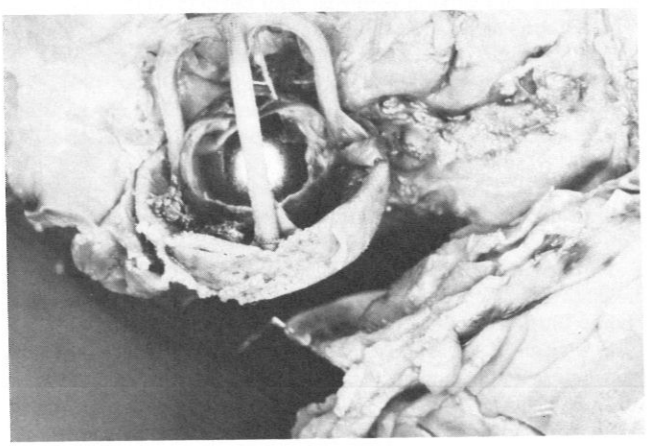


FIGURE 4. Autopsy specimen shows thrombotic material at annulus of valve preventing ball from seating properly. The struts of the prosthesis are also covered by friable fibrinoid material.

crit values for patients with dysfunctional valves ranged from 23% to 38% (mean 29%, standard deviation 5.215), while hematocrits for patients with intact valves ranged from 28% to 34% (mean 31.3%, standard deviation 3.05).

Three of the ten valves showed no signs of significant wear. Seven of the ten valves showed signs of dysfunction ranging from moderate fibrotic stenosis of the annulus to obvious ruptures in the knotted fabric on the struts, with a denuded metal flange in the annulus of the valve (Figure 4).

On comparing patients' survival time to valve wear characteristics and clinical data, we found a mean survival time of 20 months for dysfunctional valves compared to 19 months for nondisrupted valves; this difference in survival time is not statistically significant.

No deaths were unequivocally attributed to valve dysfunction. The most clear-cut demonstration of morbidity related to valve dysfunction is reported in the case of the lone surviving patient (Patient 1).

DISCUSSION

Use of caged-ball prosthetic aortic valves dates back to 1954, when Hufnagel (*4*) first treated aortic regurgitation with a valve of his own design. The Hufnagel prosthesis was a lucite ball in a solid cylindrical lucite cage; the prosthesis was designed to be rapidly inserted in the descending aorta and held in place by fixation rings. Several complications were observed, including a high incidence of peripheral embolization, frank thrombosis of the entire valve, and infection. Over the next 10 years, Harken (*1*) and others developed flexible valve leaflets to implant within the heart. When the strength of these materials quickly became a critical factor, Harken (*2*) and Starr (*5*) began work to develop a rigid prosthetic valve based, ironically, on the caged-ball principle. Starr performed the first clinically successful implantation of the new valve in 1960 (*5*).

Thrombogenicity continued to be a major problem of implanting the early valves. Since the prosthetic valve is a foreign object in the bloodstream, protein is adsorbed onto its surface and platelets are stimulated to adhere and aggregate, encouraging thrombosis and embolization. Attempts to reduce thrombogenicity led to Braunwald and Boncheck's discovery that tissue ingrowth on porous, fabric-covered prostheses minimized thrombus formation (*6*). The logical extension of this discovery was to cover the cage with porous fabric, from which came the cloth-covered 2300 series Starr-Edwards aortic

valves, later replaced by the 2310 and 2320 series.

Complications associated with the 2300 series of valves included unsatisfactory postoperative valve gradients (*7*) and excessive tissue ingrowth which further compromised the function of the valve (*8*). The 2310 series valves reportedly caused a lower rate of embolism but showed increased fabric wear on the struts (*9*). Also, reduced clearance between ball and struts, a design improvement intended to increase the durability of cloth around the orifice of the annulus, predisposed these valves to problems of ball sticking (*3*). Design modifications for the newer 2320 aortic valves have reduced thrombogenicity and increased the valve's durability.

Hodam and his associates (*10*) in their review of 120 patients with isolated aortic valve replacement and 48 patients with multiple valve replacement with Starr-Edwards model 2310 aortic prostheses found elevated serum LDH levels, an index of hemolysis, in all patients; the mean hematocrit was 41.2% (standard deviation, 3.05). These values are significantly higher than values we observed in patients with valve dysfunction during our study, but not statistically different from the values we obtained in patients without significant dysfunction. We did not see the "stuck ball syndrome" reported by Hodam in any of our patients.

In a nine-year review of 1,022 patients whose aortic valve was replaced with a Starr-Edwards prosthesis, Banhorst and his associates (*11*) observed an 80% probability of survival in patients who survived the first 30 days after the model 2310 prosthesis was substituted for the aortic valve. In addition, they predicted these probabilities of five-year survival based on the dominant aortic lesion: aortic stenosis and aortic insufficiency, 70%; aortic stenosis only, 80%; aortic insufficiency only, 82%. These survival rates are much higher than the 20-month mean survival time we observed in our patients.

In assessing late demise among 957 patients, Banhorst found these to be the principal causes of death: sudden unexpected death (25%), coronary disease (17%), thromboembolism (15%), congestive heart failure (9%), and bacterial endocarditis (8%). Valve failure accounted for 7% of the deaths (thrombus 3%, dehiscence 3%, and ball variance 1%). These rates are not significantly different from our observations.

In a six-year appraisal of late complications following aortic replacement of the valve with cloth-covered, composite-seat model 2310 and 2320 prostheses, Starr and his associates (*12*) followed 116 patients who were anticoagulated with warfarin postoperatively and 134 patients who were not anticoagulated postoperatively. The number of late deaths in the anticoagulated group was 14%, compared to 16% in the group that was not anticoagulated. The causes of death did not differ significantly between the two groups, with congestive heart failure and coronary artery disease the principal causes. The main cause of prosthesis-related death in both groups was bacterial endocarditis. These findings are similar to our observations, but the survival time reported is considerably longer than we observed. However, since Starr's study included 46% Class I and 41% Class II patients, and only 12% Class III and 1% Class IV patients, the difference in survival times may be explained on the basis of higher selectivity.

CONCLUSION

Starr-Edwards series 2300 aortic valves have clear design limitations. The ultimate goal of aortic valve replacement is to improve the patient's clinical condition and to avoid postoperative complications. A continued effort to improve prostheses and develop superior new designs and materials is warranted.

REFERENCES

1. Harken DE, et al: Partial and complete prostheses in aortic insufficiency. J Thorac Cardiovasc Surg 40:744, 1960.
2. Harken DE, et al: Aortic valve replacement with a caged-ball valve. Am J Cardiol 9:292, 1962.
3. Roberts WC, et al: Pathologic anatomy of cardiac valve replacement: A study of 224 necropsy patients. Prog Cardiovasc Dis 15:539, 1973.
4. Hufnagel CA, et al: Surgical correction of aortic insufficiency. Surgery 35:673, 1954.
5. Starr A, Edwards ML: Mitral replacement: Clinical experience with a ball-valve prosthesis. Ann Surg 154:776, 1961.
6. Braunwald NS, Boncheck LI: Prevention of thrombus formation on rigid prosthetic heart valves by the ingrowth of autogenous tissue. J Thorac Cardiovasc Surg 54:630, 1967.
7. Bristow JD, et al: Clinical and hemodynamic observations after combined aortic and mitral replacement. Circulation 31-32 (suppl 1):67, 1965.
8. Winter TO, et al: Current status of Starr-Edwards cloth-covered prosthetic cardiac valves. Circulation 33-34(suppl 2):69, 1971.
9. Boruchow IB, et al: Complications following destruction of the cloth covering of a Starr-Edwards aortic valve prosthesis. J Thorac Cardiovasc Surg 62:290, 1971.
10. Hodam R, et al: Further evaluation of the composite seat cloth-covered aortic prosthesis. Ann Thorac Surg 12:621, 1971.
11. Banhorst DA, et al: Isolated replacement of the aortic valve with the Starr-Edwards prosthesis. J Thorac Cardiovasc Surg 70:113, 1975.
12. Starr A, et al: Late complications of aortic valve replacement with cloth-covered composite-seat prostheses. Ann Thorac Surg 19-289, 1975.

Letters

SURGERY AT SEA

Medical officers at sea don't have the facilities to perform major surgery—so thought LCDR Danny V. Cantwell (MC), a general surgeon, when he began his tour aboard the USS John F. Kennedy *in July 1976. But things are seldom what they seem, as LCDR Cantwell reports. [Ed.]*

Expecting a dearth of surgery and an excess of imaginary illness, I was pleasantly surprised to find myself embroiled in an appendectomy our first day at sea. Little did I suspect that we would do so much major surgery in just my first two months aboard. The physical facilities were remarkably complete and gave us the capability of salvaging severely injured patients.

Surgery cannot take place without competent anesthesia, and the *Kennedy* was fortunate to have an oral surgeon and a flight surgeon to administer excellent general and regional anesthesia. Although the ship is not a regional medical center, imagination, drugs, instruments and suture made possible a remarkable array of surgical procedures. Indeed all emergency and most elective procedures which could be accomplished with local or regional anesthesia were performed without complications. Postoperative care was adequate. Many men underwent herniorrhaphy or appendectomy with relatively rapid return to limited or full duty, and without the need for costly hospitalization or a long wait for shore-based care or convalescence.

The true test of our surgical team came on 14 Sept 1976, the day of the collision with the USS *Bordelon*. Movement of patients from the *Bordelon* and prompt triage resulted in efficient treatment of a moderate number of casualties. Previously established blood donor procedures provided rapid availability of type-specific blood and enabled us to save two lives. Resuscitating and operating on a severely injured patient was not only possible but surprisingly easy because of our prior preparation. The aeromedical evacuation system was found to be somewhat cumbersome. Most patients can and should be treated on the *Kennedy* until they are stable and a planned aeromedical evacuation can be arranged. The *Kennedy*'s excellent medical facilities enabled us to render more sophisticated emergency care to the task force than is generally appreciated.

LCDR D.V. Cantwell, MC, USNR
Medical Department
USS *John F. Kennedy*
FPO New York 09501

COLD MEDICATIONS

I want to congratulate *U.S. Navy Medicine* and CDR Gorske for the article entitled "Let's Stop Prescribing Cold Medications" [*US Nav Med* 67(11):10-13, Nov 1976].

Thomas E. Frothingham, M.D.
Professor of Pediatrics and
Community Health Sciences
Duke University Medical Center
Durham, N.C. 27710

PREMED ADVICE FOR CORPSMEN

During a recent active-duty-for-training period at Naval Regional Medical Center, Great Lakes, Ill., I was assigned to the medical center's education and training office and spoke with many hospital corpsmen who visited the office to ask about pre-medical courses offered in the evening at local colleges. It was evident that some of these corpsmen had unrealistic ideas about the qualifications needed to gain admission to medical school. While most of them recognized the importance of maintaining a high scholastic average, they did not know the exact grade point average attained by applicants who were successful in the past. Relatively few of the corpsmen realized that they must get acquainted with their evening school professors if they hoped to obtain meaningful recommendations from them. The format of the medical college admissions test, and procedures used to interview medical school applicants also were unfamiliar to these prospective medical school applicants.

These corpsmen were certainly well motivated to pursue careers as physicians. Their daily work indicated their concern for the well-being of others, and they had a realistic view of a practicing physician's duties. But they were not aware that even as part-time students they were establishing their academic value.

I suggest that a pre-med advisory council similar to the pre-med clubs on college campuses be established at NRMC Great Lakes and other regional medical centers. This council could be chaired by medical officers who are recent medical school graduates and who recognize the problems of gaining admission to medical school.

Information on admissions procedures and requirements and on trends in medical education is available from the Association of American Medical Colleges, 1 Dupont Circle N.W., Washington, D.C. 20036. This association publishes two useful journals—*The Advisor* and the *Journal of Medical Education*—a weekly newsletter, and the annual book, *Medical School Admissions Requirements*, all of which contain information about American and Canadian medical schools. Topics of interest to the medical school applicant are covered in the last issue each year of the *Journal of the American Medical Association*.

Many regional medical centers are located near medical schools. Members of admissions committees and other faculty members at those schools could be asked to speak to a highly motivated group of hospital corpsmen. Such programs would be informative for future medical school applicants and would boost the morale of participating hospital corpsmen.

CDR A.M. Earle, MSC, USNR
Associate Professor of Anatomy
The University of Nebraska
Medical Center
Omaha, Neb. 68105

☆U.S. GOVERNMENT PRINTING OFFICE: 1977-240-812/V-2

U.S. NAVAL PUBLICATIONS and FORMS CENTER
ATTN: CODE 306
5801 Tabor Avenue
Philadelphia, Pa. 19120
Official Business

POSTAGE AND FEES PAID
DEPARTMENT OF THE NAVY
DoD-316

CONTROLLED CIRCULATION RATE

SUBSCRIPTIONS AVAILABLE

U.S. NAVY MEDICINE is now available by subscription. Supporters of Navy medicine who are not eligible for free distribution, or who want their copy sent to their home address may order a personal subscription through the U.S. Government Printing Office. Subscription rates are $11 per year (12 issues) to addresses within the U.S., and $14 per year to foreign addresses.

Enter my subscription to U.S. NAVY MEDICINE.—$11.00 domestic mailing—$14.00 foreign mailing. (Subscription rates include postage and handling costs. Make checks payable to Superintendent of Documents.)

Send Subscription to:

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT

MAIL SUBSCRIPTION FORM TO:
Assistant Public Printer
(Superintendent of Documents)
Government Printing Office
Washington, DC 20402

U.S. NAVY MEDICINE